

Wall Street pundits fear 'reversal' on computers

THE ongoing rally on Wall Street may be the last big rise before a sharp decline, according to one technical analyst. However, that pessimistic view is not held by all Wall Street's pundits these days, and some investment advisers have interpreted recent events as a sign that investor confidence is truly on the upswing, which could lead to a continued bull market.

The bearish view is that of Joseph C. Generalis, technical analyst at Oppenheimer, but its publication was preceded by a cautionary notice from the firm. Technical trend analysis is only one way to look at the market, and it can result in inaccurate predictions.

Nevertheless, the Generalis report is striking in its assuredness, and it is being read carefully by many serious investors, including many of the largest financial institutions in the States.

Generalis foresees the rise in the market that went on through August but he feels that a major decline in stock prices will follow as a four-year cycle comes to an end. A four-to-six-week rise in stock prices could, he believes, lead to a levelling-off of market averages. Then, next spring, Generalis predicts there will be a steep drop in

stock values, with the Dow Jones industrial average, currently around 900, falling below 650 and possibly as low as 550. Such a decline would not necessarily include all stocks, but few companies could expect their share values to withstand any severe erosion of investor confidence.

Gene Collins, of Evans & Co., on the other hand, believes that investors will experience a long-term growth in the value of their stocks. He believes that Wall

Street's rising prices are due to institutions seeking "beyond the valley of short-term difficulty" to a general improvement in the fortunes of American business.

Computer industry stocks, including IBM, have risen dramatically during the past few weeks, and the expectation of those with confidence in the market is that the prices of these stocks will continue to climb. IBM, for example, will be shipping many new systems in the

303X range during 1979, and the sales will be reflected in increased earnings.

While some computer industry analysts, such as Oppenheimer's Gideon Gartner, have characterised IBM as "nearly recession-proof," recent history is by no means an infallible determinant of the financial prospects of the industry giant.

The key indicator to many investors will be the prime interest rates, those charged by banks to their customers. If the

expected decline in interest rates does not materialise soon, inflation will worsen and an economic downturn in the US would most likely ensue.

Mainstream economic opinion is that inflation will level off, but some economists have little faith in the theories that have been used as a basis for the forecasts. Much depends on the attitude of OPEC and the hope that no world crises will test America's military or political strength.

NEWS FROM AMERICA BY HESH WIENER

AT&T's digital network seen as threat to the mini market

EVERYBODY who is anybody on the American computer scene has been guessing at the impact of AT&T's planned digital network, the Advanced Communications System (ACS, July 27). But Howard Anderson, head of the Yankee Group, the US consultants has won the attention of big business — and it is expected he will soon earn the wrath of small computer

makers. Anderson, more than any other data processing pundit, is warning the minicomputer industry that ACS spells trouble for makers of small processors. ACS, says Anderson, will "expand the market for dumb terminals while shrinking the market for intelligent terminals. It will expand the market for computers but will shrink the

market for minicomputers, because it will use minicomputers internally."

The one beneficiary of ACS among the mini makers, according to Anderson, will be Digital Equipment. "Instead of selling to the end users, DEC will be selling to the Bell System which will then resell the computer power to the end user." ACS is expected to use the PDP-11/70

or the forthcoming 11/74 in its local processing stations.

This shift in an important market may hurt such lively competitors as Data General, now caught in a three-way squeeze.

The pressures on Data General, typical of those on other minicomputer makers, come from IBM, which increasingly adds utility to its Series 1 systems through the release of software packages, microcomputer makers, including the semiconductor houses, which have taken over large segments of the low-end processor market; and manufacturers of dedicated small business systems, which offer turnkey applications systems (Basic Four, for example) or greatly simplified programming (Logical Machine).

Hewlett-Packard will be vulnerable as well, because its computer group invested thousands of dollars in the development of networking software, sent out high-priced management consultants to promote its products as complementary to those of IBM, and put a series of intelligent terminals on the market based on current and future silicon-on-sapphire technology that cost a lot to develop. ACS could render much of the communications work at HP obsolete or unsaleable.

Hewlett-Packard, like many users, was led to its commitment by a belief among its managers that IBM will set the pace during the 1980s. With ACS most likely on the way, there will in fact be two choices for users with communications needs.

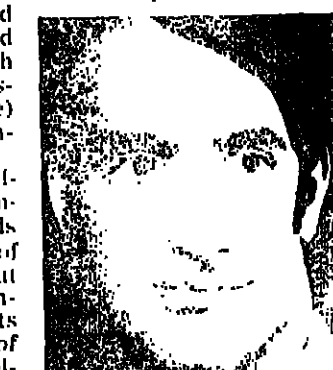
While IBM and AT&T battle for customers, those companies that have staked their future on selling private networks to America's industrial giants will be left to fight over the tiny bits of territory the giants overlook.

The Yankee Group, believes that 62 per cent of the top 500

Industrial companies are thinking about implementing an intelligent network. Anderson feels these organisations have three choices — IBM, AT&T, or a do-it-yourself approach.

The idea of assembling a network from independent components "doesn't make sense anymore, and maybe it never did," says Anderson.

Nevertheless, business has not held off on building networks to meet its immediate needs. There are 2,500 private networks in the US today. With ACS, Anderson believes there will be 7,500 such facilities by 1985.



HOWARD ANDERSON, head of the Yankee Group, says the advent of AT&T's ACS will be a threat to small computer makers.

AT&T will devote enormous resources to marketing ACS. The company's future, he says, is "inextricably linked" to ACS. This is because the backbone of AT&T's business is presently its Long Lines division, which provides inter-city trunks. Long lines, without ACS among its offerings, may well succumb to competition from Satellite Business Systems and the host of microwave services.

The Yankee Group's in-depth report on ACS is available for \$600 from the company at Post Office Box 43, Harvard Square Station, Cambridge, Massachusetts 02138.

Social Security files are 'not safe'

THE US Social Security Administration's financial and medical data files on millions of Americans "are not properly safeguarded from potential loss, destruction, abuse or misuse," that was the sobering message delivered by the US General Accounting Office in a report just made public.

In the fiscal year 1977, GAO states, the SSA's massive data processing system serviced over 33 million beneficiaries sharing some \$103,000 million annually. "With the vast number of records, and the number of offices involved in the SSA operations, safeguards must be present to prevent unauthorised alterations, destruction, abuse, or misuse of beneficiary records — a valuable national resource," the audit agency asserts.

According to GAO, the investigation of SSA's computer and telecommunications operations was prompted in part by reports to some Congressmen that SSA employees manipulate the files for personal profit. On one instance, GAO says, a "private company built a flourishing business by gaining unauthorised access to federal medical records and selling the information to many of the nation's largest insurance companies."

The Accounting Office also cites several system design and management problems at SSA which have led to "security weaknesses". They include the ability to create as well as query beneficiary files from most terminals, failure to use audit trail features within the system; failure always to lock terminals during non-working hours; and unlimited and unrestricted access to terminals.

Also, GAO points out, hard copy beneficiary records are vulnerable to potential abuse and/or misuse and destruction in most field offices because of problems associated with the way claimant files are stored; the readily available use of

microfilm files and photocopy equipment; weaknesses in securing field offices after working hours; inadequate fire protection; the way sensitive documents are disposed; safeguarding beneficiary data; and security background checks of employees.

GAO points out, however, that during the course of its

review, SSA has taken some precautions that could lead to an "active" security program.

Acting SSA Commissioner Don Wortman commented, "We have already taken steps to ensure that personal information in our computer system is made more secure." He pledged that further security measures are on the way.

Concern at decline in research

DUE to growing concern over the decline in innovative research and development by American industry, President Carter has created an inter-agency committee to review issues and problems related to industrial innovation. Chairing the newly-formed committee is Juanita M. Kreps, Secretary of Commerce.

According to Kreps, the number of patents granted to US citizens declined 21 per cent between 1971 and 1976. During the same period, she points out, patents to foreign residents grew 18 per cent. She adds that by 1976, 37 per cent of all US patents were going to foreigners.

"Our share of world manufacturing exports simultaneously has been shrinking, with notice-

able effect on our balance of trade," says Kreps. "Some countries now appear to be beating us at our own game: developing and exporting innovative technology."

The committee is charged with examining the impact on innovation of federal economic policy, regulatory policy and foreign relations. The group is expected to report its findings within 14 months.

Other members of the committee are the White House Science Adviser; the Secretaries

WASHINGTON REPORT BY CAMERON DAVIS

Government offers users a network measurement system

RESEARCHERS at the US National Bureau of Standards have developed a Network Measurement System to help users evaluate the quality of computer services delivered through computer networks. The NMS measures the service delivered to the user rather than the internal operating efficiency of the system.

"All a computer network user really wants to know is 'What's in it for me,'" explains an NBS spokesman. "He isn't terribly concerned with the throughput of the entire system."

With NMS, he says, users can determine the level of service being provided, decide on needed improvements, and evaluate the effects of changes made.

The NMS consists of a data acquisition device called the Network Measurement Machine and a Data Analysis Package that provides information about the quality of network service delivered to interactive terminal users, as well as the nature of user demand and network utilisation.

The system measures network performance in terms of such quantifiable elements as response time (the elapsed time from the last keystroke made by the user's terminal) and interactive turnaround time (the elapsed time from the beginning to the end of a specified job or function).

The NMS is implemented on a minicomputer employing regular and special purpose hardware controlled by a specially-written software system. The regular hardware includes the processor, an operator's console, disc and magnetic tape storage, two programmable clocks, and data communications interfaces.

Special purpose hardware is used to connect the NMS to the network to be measured. It includes an automatic calling unit and line selector for computer-controlled origination and answering of data calls, and a specially designed communications line interconnection device called a "data probe."

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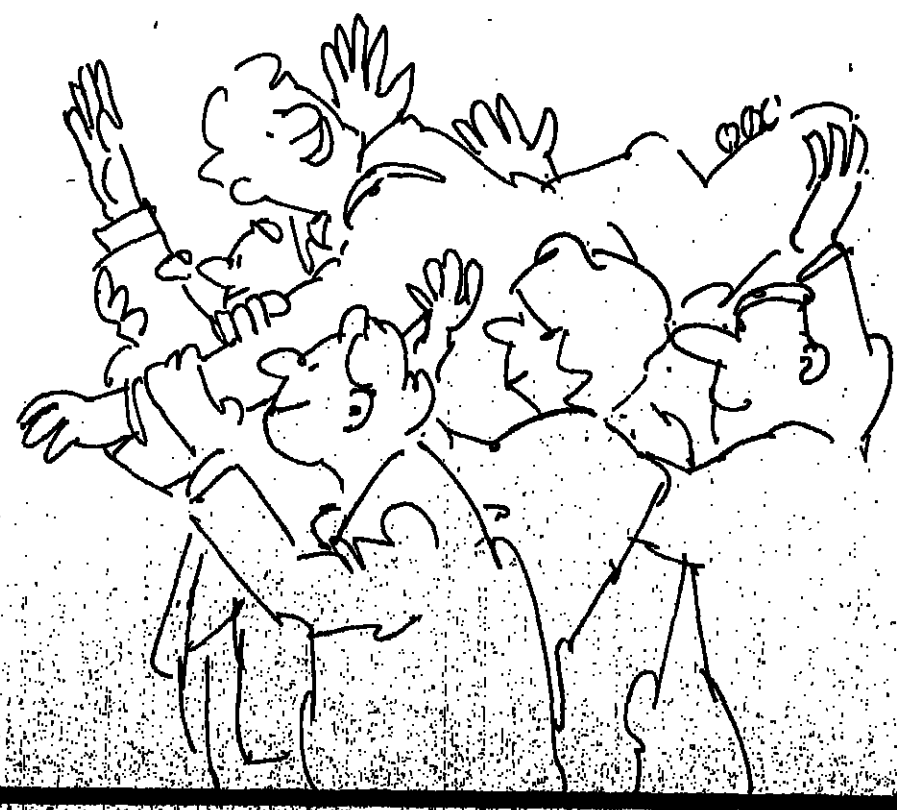
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Government abandons magnetic passports

THE US government, which has been seeking an advanced way to control the use of passports, has abandoned earlier plans that included the use of magnetic cards to passport holders, and according to some sources, all other citizens as well.

The current scheme to update manually-handled passports, according to Privacy Journal, involves the use of optically-read cards that could also be interpreted by humans, including the bearers of the identification documents.

The change was reported to stem from new people in the Department of State's Passport Office. Frances Knight, who had run that office for years, and who advocated the use of identity cards by all citizens, has been replaced by Loren E. Lawrence, characterised by Privacy Journal as a career diplomat.

One reason for abandoning the magnetic card idea, according to the Washington periodical, is the

be altered without the knowledge of the bearer. The other key issue was the way the public would react.

Privacy Journal quotes Lawrence as saying, "The public would not stand for any data on cards all be read by the state itself." Other nations are believed to agree with Loren's conclusion.

In an unrelated story, Privacy Journal notes that the National Centre for Health Statistics is developing a national death index computer, reportedly to be used by medical researchers. The index will contain names, medical names, social security numbers and information about the death of the individual. The system is due to start in January.

DP has vital role in national security

THERE are times when the best is not good enough. Although the US Department of Defence is recognised as the government-wide leader in the management and use of computers, it evidences "many areas of organisational serious concern" that deserve immediate attention for national security.

That was the conclusion reached by one of 10 task force teams involved in the US government's Federal Data Processing Reorganisation Project.

"The role of computers in the area of national security is a vital one and is not receiving attention commensurate with this importance," said the national security taskforce. "In a future conflict, intelligent computer management could have a major impact on the success of the national effort and would extend beyond purely military areas."

Another major problem cited by the DP reorganisation taskforce is that the clear identification of computer technology as a career speciality has been treated differently by Army, Navy and Air Force units.

"Since none of the three services deals with the matter comprehensively, a great many competent personnel have been lost at the periods in their career when productivity and value is at its peak," the team reported. "This is a tremendous economic loss to the nation."

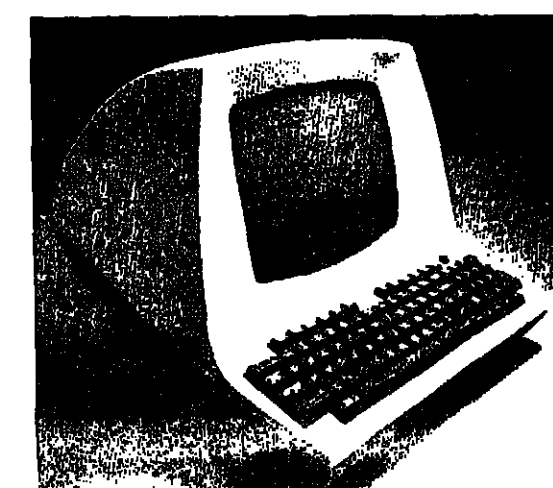
The defence study group also criticised DoD for not knowing

the total dollar value of its DP resources, as well as for failing to manage centrally this "significant" resource. It also said that within the defence services there is no standard pattern of organisational authority or policy regarding DP management.

Further, the study team found, DoD's acquisition of computers is dealt with in a different manner depending on whether they are for administrative use or for use within weapons or intelligence systems. "This has led to a high degree of frustration and a resultant waste of considerable manpower," the team claimed.

Looking at the individual defence agencies, the study team found that the Air Force has yet to recognise that the influence of DP on its mission is all-encompassing. Often, it said, the DP resources are managed on a part-time basis by someone with other responsibilities as well. This has led to a deterioration both in the status and recognition of the DP career patterns, and as a result many valuable personnel have been lost.

As for the Army, the task force reported that the absence of strong, cohesive management of all automation/telecommunications has led to a fragmentation of efforts in this area which could, if left unchecked, severely inhibit the Army's ability to enhance its readiness by the use of automated systems.



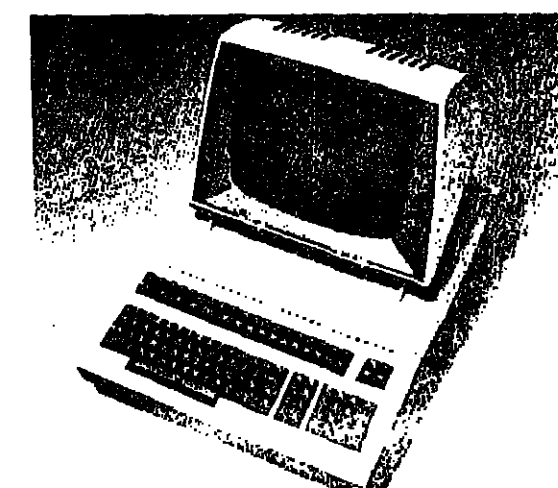
ADM-31 WITH TWO PAGES OF DISPLAY

The ADM31 is a low-cost high reliability desk top CRT with full editing, formatting and two pages of display. So the ADM31 has twice the display potential with many of the attributes of terminals costing twice as much.

The ADM31 is completely self contained, with a keyboard, control logic, character generator, refresh memory, and interface. What's more, it incorporates a microprocessor which augments its reliability while making it even easier to use. Block transmission and protected fields are standard, with a printer port option.

The ADM31's amazing 90 key keyboard is integrated with the main logic, and is capable of generating all 128 ASCII characters (upper and lower case, numerals, punctuation, and control). It features an integral numeric pad, with period, comma, tab, minus, and numerals arranged in calculator format. The ADM31 is editing capabilities let you clear the screen, or use a destructive cursor for a character change. Read and load cursor permits sensing of the current address, and direct, absolute addressing to any X-Y coordinate. The controls let you skip protected fields, backspace, forward, move up, down, return, home, and new line. And you can more Control Characters which are displayed as unique symbols.

The ADM31 comes with character insert/delete, line insert/delete, erase to end of line/field/green, back tab, can clear to protected spaces, clear to unprotected nulls and set and reset copy/print.



ADM-42 ALL BUT THINKS FOR ITSELF

The ADM42 is a semi-intelligent terminal that gives the user flexibility of format, security, editing, interface, and transmission. Like the ADM31 it features a full two page display, but it also has an optional extended memory capable of adding data space in 2 page increments up to a maximum of 8 pages.

The terminal boasts a bright, easy-to-read, 2000 character display, a full 128 ASCII character set, 16 function keys for 32 separate commands, and five separate cursor control keys, plus an optional Programmable Function Key feature that lets you define the function keys. An alternate character generator giving an additional 128 characters and a line drawing set is also available.

The ADM42 displays on screen a wide range of information at a glance, and special symbols indicate the entry of all control characters in memory. The ADM42's Field Protect Mode also allows rapid data entry into forms or instruction pages. The ADM42's displayed data is formatted in 24 lines of 80 characters and it has an 80 character 28th line for status indicators, or special messages.

Screen attributes of the ADM42 include Field Blinking/Underline, Field Blinking and Reverse Video, which you, or the computer, can designate for use on areas of the display.

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AT&T's submission of its proposed Advanced Communications System (ACS) to the US Federal Communications Commission for approval has once more focused attention on public data networks on both sides of the Atlantic. France was the first European country to offer specialised data networks of all types — circuit switched, packet switched, and leased channel, and the French PTT is the leading advocate of packet switched

networks, against the opposition of the West German Post Office, which advocates circuit switched networks. The debate between the advocates of circuit switched and packet switched systems has hitherto obscured a much more important question. Is the separation of data from voice traffic a good idea on any but the shortest time scale with the minimum of investment? Will the sums now being invested in public networks help or hinder the

development of data communications in the 1980s, and the widely predicted integration of telecommunications with data processing and office automation? In this MARKETVIEW, Fred Lamond discusses the technological and economic background to the networks that already operate in France, West Germany and the UK, and the arguments for and against their further development in the next few years.

Solving the dilemma of public networks

A DATA network is a specialised telecommunications system restricted to digital data exchanged between computer terminals, processors, and perhaps even facsimile receivers and transmitters, but excluding voice and TV.

It is characterised either by separate circuits from those of the normal telephone network, or by separate trunk circuits, or by both, and may have its own switching exchanges if it is a switched network.

Public data networks are those provided by the PTTs themselves, on which they provide either circuit switching or packet switching exchanges to link any user to any other. In addition, the French and West German PTTs have given network names to some of the leased channel facilities that they provide to users for their private networks. Table 1 gives a list of public data networks offered in Europe and the line speeds that they offer.

In circuit switched data networks, PTT switching exchanges establish a temporary circuit connection of given throughput speed between two computers and/or terminals connected to the network at any point. All error checking and correction and other handshaking procedures are left to end-to-end protocols implemented on the computers and terminals that users connect to these networks.

The time and distance dependent call charges make it no more expensive to implement an SNA-type hierarchical polling system on a circuit switched data network than a distributed network architecture like Decnet.

West Germany opened the 200 bps Datex network in 1987 for teletypewriter-to-computer communications, and France followed suit by boosting its Telex network to 200 bps in 1989.

In 1973, France opened the switched Caducee network for full-duplex 2,400, 4,800 and 9,600 bps communications, with additional 48K, 64K and 72K bps switched facilities within the Greater Paris area. West Germany opened a 2,400 bps Datex service in 1976, and 300, 4,800 and 9,600 bps Datex services in 1978.

Telex lines and the original 200 bps West German Datex lines are digital and separate from the telephone network only as far as the nearest telex exchange. There they are modulated into analogue waves by PTT modems and frequency division multiplexed on the same 48 KHz, 240 KHz and 2 MHz carrier channels as voice telephone lines.

The Caducee network shares the telephone network's FDM analogue carrier channels between its 14 access points and concentrators and the single switching centre in Paris. The subscriber end circuits are analogue, but the Paris switching exchange is digital. It can therefore accept digital switching signals from connected computers and terminals at 2,400 bps, and thus establish circuit switched connections in under 1 second.

It was for the sake of the fast digital switching of temporary circuit connections that the West German Federal Post Office developed the separate Electronic Data System digital data network in 1976. This is a high level trunk network of

wideband PCM carriers connecting a single national switching centre in Mannheim with 17 other regional concentrators and access points, Figure 1.

Unlike Caducee, the German EDS uses PCM digital carriers between its regional concentrators and Mannheim with time division multiplexing. This enables the Siemens EDX control computer at Mannheim to allocate available trunk capacity variably in the light of traffic demand.

EDS carries also the trunk portion of the Direkttrunknetz leased channels and allocates the required trunk capacity to any permanent leased circuit only when this becomes active. By its very nature, circuit switching cannot recuperate that part of a temporary circuit's throughput capacity that the two connected computers or terminals do not use.

It is in order to eliminate this wastage trunk channel capacity that the French PTT and British Post Office have pioneered their experimental RCP and EPSS packet switching data networks, and are planning to replace them in 1979 by Transpac in France and, perhaps the NPSS or PSS networks in the UK, that will conform to the new CCITT X25 norm.

Transpac will link at its inception 12 nodal switching exchanges and 13 other access points and concentrators throughout France. British plans for NPSS are more modest and provide for only three switching exchanges in London, Birmingham and Manchester with access points and concentrators in six other cities.

In packet switching networks, no trunk channel capacity is

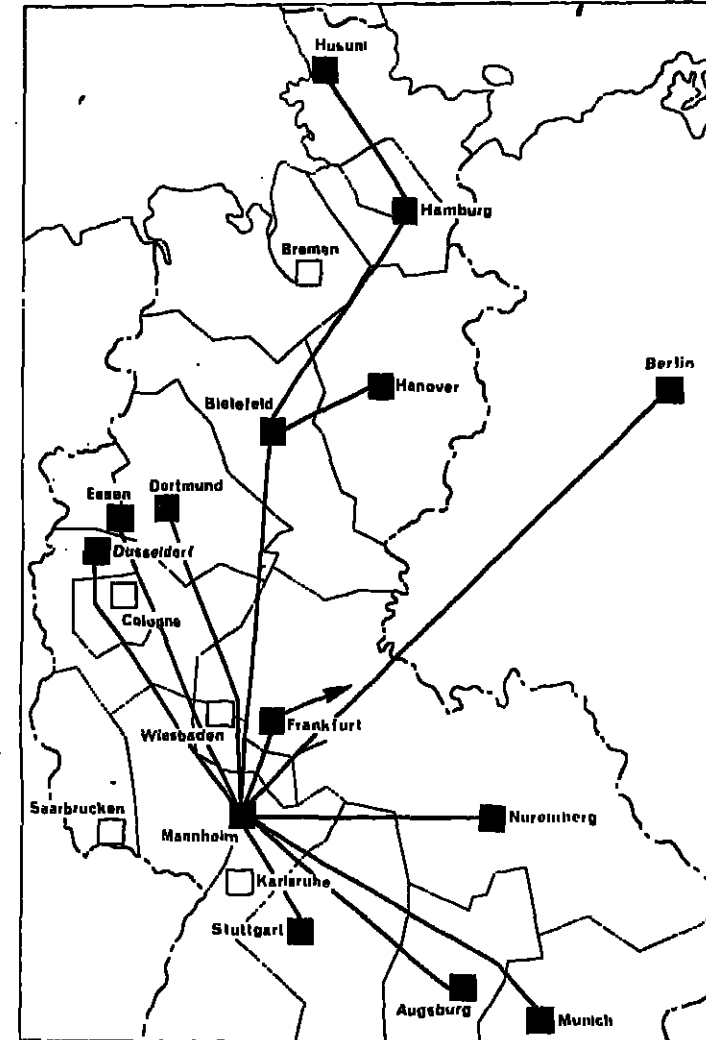


Figure 1: The West German Post Office EDS network as it stood in mid-1978. The black squares show the concentrators in use in July, 1977; the white squares show the concentrators that are due to be in operation by 1980. Links to foreign networks are made via the Frankfurt exchange.

ever wasted as long as there is any data traffic from anywhere to take advantage of it. Trunk links between nodal exchanges

or concentrators are used to transport at a uniform speed standard "packets" of up to 1,024 information bits from any

of the up to 4,096 "logical channels".

As each packet contains its own logical channel number in its "envelope", packets from different logical channels can be interleaved on each trunk link between two nodes in any sequence as they arrive at the dispatching node.

This economy of trunk capacity usage is also reflected in the charges. While these contain a moderate connection fee, the main component will be for the transmission of each "packet" irrespective of the distance over which it travels.

However, this greater efficiency of trunk channel usage involves considerable additional overheads for hardware and software for both the common carrier and the network users. At each station in the transmission path handshaking, error checking and correction procedures have to be carried out afresh and in each package some of the 1,024 bits would have to be allocated to these protocols.

The French PTT and other X25 supporters claim that public network intervention in the definition and implementation of data link protocols will impose a measure of standardisation on computer-terminal data communications, and thus open up the market to any manufacturer's terminals to exchange data with any manufacturer's host computers.

This is a somewhat doubtful claim. There is nothing in X25 to prevent IBM or any other computer manufacturer from incorporating secret software keys in the information bit streams that their terminals send, and allowing only information bit streams that incorporate these keys to access certain proprie-

tary systems or applications software on the host computers. It is not because X25 could be effective in opening the market to greater competition that IBM criticises it so strongly. It is because the volume dependent charging method, based on numbers of packets transmitted adopted by PTTs for packet switching networks penalises hierarchical polling user network architectures, like SNA, and favours distributed contention network architectures like Decnet.

The implementation of X25 compatible protocol interfaces will also involve all computer and terminal manufacturers in additional hardware and software costs, that will inevitably be passed on to the users in the form of higher prices.

The only exceptions will be teletypewriter and TTY-compatible display terminals with transfer rates of 300 bps or less.

Computer and terminal manufacturers and their users will not be alone in facing increased costs on packet switching networks. The PTTs' own investment in nodal switching mid-computers and their software to run a network like Transpac is considerable.

Is this a proper channel for investment of scarce public funds by state-owned monopoly common carriers? Could the same funds, if invested in additional microwave carriers or a communications satellite, not

be more effectively used? Duing to a typographical error the final sentence of the last Marketview (CWI, July 13) was incorrect. The point being dealt with was the relational database system that is likely to be introduced with IBM's new H series. It is expected that this will not be available retrospectively on 370 and 303X processors and Marketview's final comment should have read: "Amidst, itel and other compatible processor users would be no worse off."

have provided far more additional trunk capacity for voice as well as data traffic, than the wasted capacity that packet switching recuperates? And how are the PTTs going to cover their network operating costs and amortise their capital investment?

The current base of computers and terminals connected to PTT telecommunications networks is narrow. A mere 47,800 in France at the end of 1976, 48,000 in the UK in March, 1977, compared with 21,770,063 telephone connections in the UK at the same date.

Moreover, a large number of the terminals connected to the telephone or telex networks at present access computers within a short distance, and are thus not potential customers for the essentially long distance packet switching networks. Those that are used for long distance data communications by the banks, insurance companies and airlines are connected to private leased line networks that are already in place and that their users would be reluctant to discard.

It is admittedly not so much with current as with future data communications traffic in mind that many PTT administrations are implementing data networks. The Eurodata study has estimated that the number of computers and terminals connected to public telecommunications networks will double between 1976 and 1980, and more than double by 1985.

However, most of this growth will be accounted for by the current private network users, such as banks and airlines, which will want to add additional terminals to their existing networks. How will the PTTs persuade them to use the new

Network	Countries	Opened	Transmission Speeds (bits/second)		Type of line	Subscriber End Circuits	Trunks	Switching	Access points	Switching exchanges
			Asynchronous	Synchronous						
A. Circuit-Switched Networks										
Telex	All Europe	1950s	50	—	FD	Digital	Analogue	Analogue	Anywhere	Many
	France	1969	75, 100, 134.5	150, 200	FD	Digital	Analogue	Analogue	Anywhere	Many
Datex 200	West Germany	1987	Up to 200	—	FD	Digital	Analogue	Analogue	Anywhere	Many
Caducee	France	1973	—	2,400, 4,800, 9,600	FD	Analogue	Analogue	Digital	15	1
	Paris area	1973	—	48K, 64K, 72K	FD	Digital	Digital	Digital	1	1
Datex (EDS)	West Germany	1976	—	2,400	FD	Digital	Digital	Digital	14	1
	Denmark, Norway, Sweden, Finland	1978	Up to 300	4,800, 9,600	FD	Analogue or Digital	Digital	Digital	4	4
Nordic		1978	Up to 300	2,400, 4,800						
B. Packet-Switched Networks										
RCP	France	1975	—	2,400, 4,800, 9,600	FD	Analogue	Digital	Digital	10	4
EPSS	UK	1976	Up to 300	600 / 1,200, 2,400, 4,800	FD	Analogue	Digital	Digital	3	3
IPSS	UK-USA traffic	1978	Up to 300, 1,200	1,200, 2,400, 4,800, 9,600	FD	Analogue	Digital	Digital	1	1
Transpac	France	1978	Up to 300	800, 1,200, 2,400, 4,800, 9,600, 19.2K, 48K	FD	Analogue or Digital	Digital	Digital	25	12
Euronet	Nine EEC countries	1979	Up to 300	600, 1,200, 2,400, 4,800, 9,600	HD or FD	Analogue or Digital	Digital	Digital	9	4
NPSS or PSS	UK	1979?	Up to 300	600, 1,200, 2,400, 4,800, 9,600	HD or FD	Analogue or Digital	Digital	Digital	9	3
C. Leased Channel Networks										
Direkttrunknetz	West Germany	1973	50, 200, 300, 1200	2,400, 4,800, 9,600 or 48K	HD or FD or S	Analogue or Digital	Analogue or Digital	Digital	Anywhere	1
Transplex	France	1973	50, 75, 110, 150, 200, 300, 600 or 1,200 for terminals	4,800 for host computers	FD	Analogue or Digital	Analogue or Digital	—	23	—
Transmic	Paris Parts of France	1978	—	2,400, 4,800, 9,600, 19.2K, 48K, 64K, 72K, 240K, 2M	FD	Digital	Digital	—	—	—

Table 1: Public data networks offered by European PTTs in 1978 or due to open in 1979. FD = Full-duplex, HD = Half-duplex, S = Simplex.

circuit or packet switched systems?

The charges on these can be made much lower than for equivalent traffic on leased lines, which is what the US and Canadian privately owned value added common carriers are doing in the competitive environment in which they find themselves.

But in those cases the available data traffic will not cover the investment before 1985, if then. And PTTs will find themselves effectively subsidising commer-

cial data traffic out of public funds. Is that sensible?

If on the other hand, the PTTs fix packet switching tariffs at levels to recoup costs by 1980, then they will get few users, because the largest users will find it more economical to retain their private leased line networks.

The only way in which the PTTs can recover their investments is by adopting the policy of charging high prices for the use of both circuit and packet

switched data networks, and even higher prices for the use of alternative data communications facilities. That is why they effectively doubled their charges to the banks for the use of their private multi-user Swift network at the beginning of 1977.

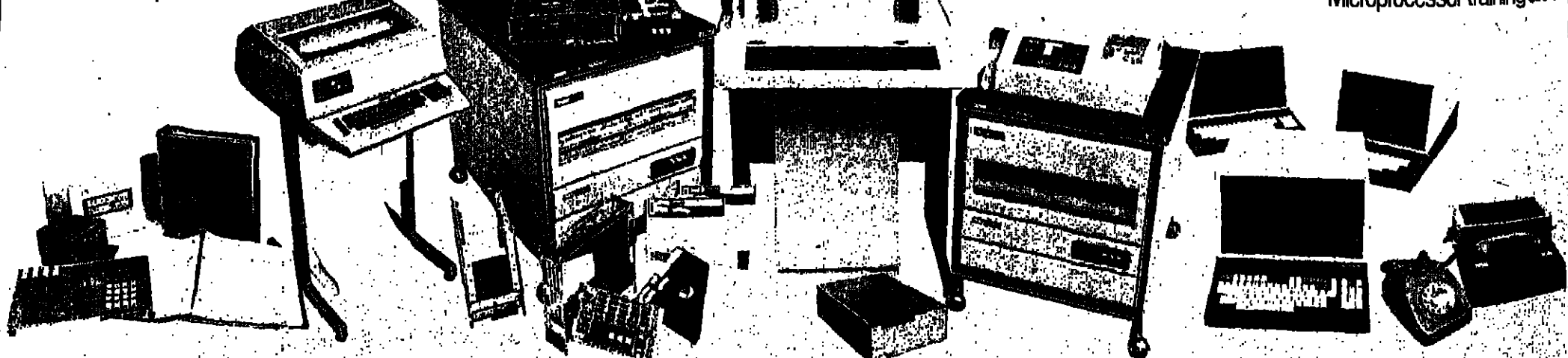
It was to make its high Datex charges artificially attractive that the West German PTT has maintained a monopoly on modems connected to the switched public telephone network, and is charging as much

for them in monthly rental as it would cost to buy them on the open market.

The end result could be that the already very expensive European data communications facilities (compared with the US and Canada) will become even more costly at a time when the manufacturing and installation cost of both trunk channel capacity (via microwave and satellites) and electronic

• Turn to page 32

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Hungary keeps up with the latest banking techniques

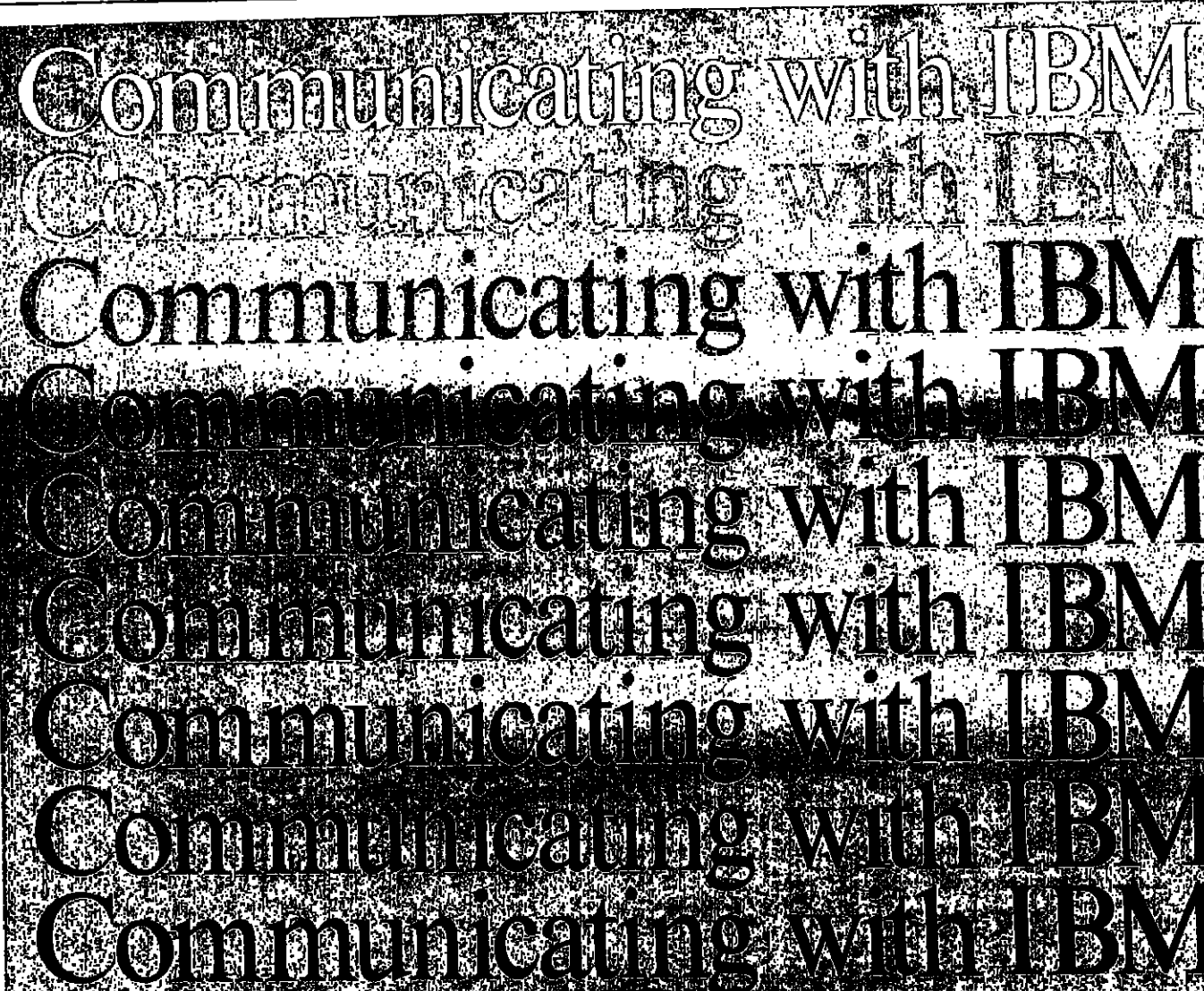
According to Joseph Keller, director of computing services at OTP, the problem faced by the bank is increasing data entry volumes coupled with a serious shortage of key punch operators. This is the result of zero unemployment in Hungary, most women already having jobs.

OCR is an area of data processing technology not being

Being controlled by a General Automation SPC 16 microcomputer with a 128K main memory and 10 Megabytes on disc, Cummins-Allison system can do a lot more than batch totals and has been programmed for RPG II to carry out disc sort account type and district.

The system processes a number of other smaller volume document types, and OTP to add a page reader to the signature for capturing into book-keeping data.

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California updates P power

A massive upgrade of its computing power, the California State Justice Department is spending \$33 million with Unisys to replace its six ageing RCA Spectra 70 mainframes. The contract involves two 1100/81s, two 90/80s and over 2,000 terminals, and the equipment is being leased for eight years.

The terminals are to be installed in over 500 law enforcement agency offices at Federal, State, Regional and County levels, and will give officers instant access to criminal record files.

The contract will be welcomed by Unisys, which acquired the installed base of RCA computers when it pulled out of the computer business some seven years ago. The Spectra 70 was built under licence in the UK as the English Electric (now ICL) System 4.

Middle East order

A LARGE contract in the Middle East has been won by Plessey Communications and Data Systems, of Beeston, Nottingham. Private manual switchboards and telephones worth £375,000 have been ordered by the Jordan Telecommunications Corp.

HAMBURG CONFERENCE ON ARTIFICIAL INTELLIGENCE

Less glamour, more science now

ARTIFICIAL Intelligence had its roots in theoretical work by the British mathematician Alan Turing and the Americans McCulloch and Pitts in the first half of this century. However, most of the work in this area has been done in the past 25 years. Until the late Sixties, most of it was done in the US, but since then there has been increasing activity in Russia, Japan, the Continent, and especially the UK. This conference reflected substantial progress by Continental researchers towards the UK and US standard.

In the last 10 years, it has been realised that many problems in AI can be solved only by equipping programs with sizable databases of facts about their domain of application. This has led to impressive programs for diagnosing diseases, identifying unknown chemicals, analysing electronic circuits, and other tasks. It has also focused attention on the need for notational systems for encoding and managing large sets of facts.

Opinion is divided on whether AI requires a special programming methodology and special programming languages. The standard languages are LISP and Pop-2, which supply flexible data structures and interactive debugging. There have been many attempts to supply "higher-level" languages, which usually reflect the theoretical viewpoints of their creators.

Most of those present at the conference seemed unenthusiastic about new languages, but there was a consensus that AI programs are subject to special complexities that make them hard to write and understand. The perception of the complexity of AI programs has aroused interest in the automation of program-writing itself, and there were many papers

Over 175 researchers from 15 countries met in Hamburg recently to report recent work in Artificial Intelligence (AI), the analysis of human mental faculties by computational methods. The conference was sponsored by the Society of Artificial Intelligence and Simulation of Behaviour, an international organisation based in Britain, and the Gesellschaft für Informatik, the German computer science organisation. One of the participants, Dr DREW McDERMOTT of Yale University, reports.

on the subject, although most of the work is still in its infancy.

There were several papers on vision research, the attempt to provide computers with eyes. As in other research areas, there has been no major "breakthrough" in vision work. Instead, we have had to settle for the more modest satisfaction that we are beginning to understand the problem — or, rather, the large complex of problems — of analysing visual input.

There were a few papers on language understanding, i.e. getting machines to communicate in a spoken or written human language. It seemed to me that natural language research is in a somewhat quiet period, possibly awaiting a shift in attitude, analogous to that in vision, toward the theoretical. This goes to that in vision, toward the theoretical. An impression may be due to the under-representation at the conference of work from the US, where most natural language research is still being done.

There were several papers on improvements of established AI techniques. Three such techniques are heuristic search (search through a practically infinite space guided by an estimate of distance to a goal), problem reduction (attacking hard problems by finding and debugging plans for solving them), and theorem proving (searching for a proof to satisfy a query).

It is theorem proving that continues to attract most attention in Europe, against the advice of the more experienced Americans. I think, however, there is hope that the Europeans are profiting by American mistakes rather than repeating them, and are being cautious in their application of this technique.

The conference was an enjoyable and profitable experience. This was largely due to the skill shown by Derek Sleeman and Hans-Helmut Nagel in running it. I was also struck by how harmonious it was. In the past, AI has often made up for lack of substance by loudness of arguments. Many conferences have witnessed noisy debates over issues that seem, in retrospect, irrelevant.

There was only one good old-fashioned debate at Hamburg, which turned on everyone's different understanding of the concept of "heterarchy" (which has to do with how programs are organised into modules).

During the rest of the conference, attention was focused on narrow technical questions. This trend will have the effect of making AI much less glamorous to the uninitiated, which is as it should be. All sciences are boring from the outside, and we seem to be acknowledging at last that AI is a very difficult science, whose basic outlines are not yet visible.

TIM PALMER PREVIEWS THE 29th SICOB WHICH OPENS IN PARIS NEXT WEEK

31 countries put their office wares on show

THE 29th annual Sicob exhibition opens next Wednesday, September 20. Nine days later, when the show closes on Friday September 29, some 300,000 visitors from 111 different countries will have taken the opportunity to examine the products from 1,755 companies in the computer and office equipment businesses. The companies from 31 countries, including a strong UK contingent, will be offering their wares from 628 stands which cram to capacity the La Defense exhibition centre in Paris.

Statistics can never tell the whole story, but they emphasise the range and scope of Sicob, which is still run more as a hobby than a business venture by a group of French entrepreneurs who decided 30 years ago that France needed a showcase to demonstrate to the world its offerings for the office equipment market.

The show, which is open from 9.30 am to 6 pm, but closed on Sunday, September 24, is best reached by the RER fast Metro line. The fast trains take about 15 minutes direct to the exhibition centre, whereas road travellers are frequently delayed for up to half an hour by traffic jams close to La Defense.

Air games

A REGULAR feature of Honeywell stands for many Sicob past has been an exhibit designed to keep jaded show visitors amused. CII-HB is carrying on the tradition, and this year follows the aviation theme with a series of games involving simulated aerial navigation.

The line-up of exhibitors is as impressive as the raw statistics. Mainframers exhibiting are headed by the French national company CII-Honeywell Bull and the world number one, IBM, and also include Burroughs and NCR.

Minimakers turn out in even greater force, and Digital Equipment, Hewlett-Packard, Data General, General Automation, Computer Automation, Interdata, Modcomp and SEL from the US will vie with SEMS and Interdata from France and Norsk Data from Norway for visitors' attention.

As befits the flag-carrier of the French industry, the CII-HB stand is always imaginative and eye-catching, and this year's display promises to be no exception.

Inspired by the futuristic Roissy-Charles de Gaulle airport to the north of Paris, the stand will consist of a number of satellites around a central course, each satellite featuring a

different aspect of the company's business. The airport theme will be emphasised with a departures board controlled by a Honeywell 316 minicomputer.

In one of the satellites, terminals attached to Level 64 and Level 66 machines at CII-HB's headquarters will demonstrate travel agency applications, and in another a Level 61 small business system with five displays and five printers will underline the versatility of the low-end line in applications for the small and medium-sized company.

The Level 6 minicomputer line, called Mini 8 in France, will be a key feature of the stand, since CII-HB is just gearing up to manufacture the minis in France, with large-scale production planned for next year.

The French public Transpac packet-switched network will not now begin public service until the end of the year, but several companies, including CII-HB, are devoting exhibits to the network, and CII-HB will emphasise the hardware and software it has designed for getting on to Transpac.

Transpac will also be featured at IBM, where demonstration of a test attachment to the network using the Series 1 minicomputer is planned. IBM will also be featuring the System 32 and 34 small business computers, the Office System 8 word-processing system, to be shown for the first time with the Qume daisy-wheel printer, and the new 5110 desk-top computer.

IBM has three major stands at the show, and one normally devoted to the French-built 3750 computer-based telephone switching system will this year be used to demonstrate the way in which voice, data and other office traffic can be combined in a single system. Intriguingly, IBM does not name the system to be demonstrated, which could be a hint that the company is planning to launch the long-awaited successor to the 3750 at Sicob. It could also be the new Series 1 communications controller for the word processing system.

Burroughs has not settled all the details of its exhibit, but plans to emphasise the baby of its low-end line, the B80 office computer, which offers users a compatible growth path through the B800 to the powerful B1800 small mainframe.

Going after the same small-business market, Kierulff introduces the 8100-8 under a new name, the 8088. Terminal driven and built around a Texas Instruments mini, it features Cobol, RPG II, Basic and For-

tran.

Key-to-disc systems will be on offer from Data 100 Corp, CMC-France and MDS, and on the graphics front, Calcomp will show the new 830-100 controller, built around the French SEMS Solar minicomputer.

British companies represented will include Ferranti, DRI and EMI Technology. Ferranti Cetec will be emphasising the CDA 40 free-standing desk-top online graphics system with digitiser table, VDU and minicomputer. DRI will show the Timedata interactive terminal. This is unique in that it is based on an array of light-emitting diodes which are touched by a light-pen in

order to call up or enter data.

EMI Technology will feature the PIX remote communications facility for setting up a network around an IBM 370 mainframe — the first time PIX has appeared at Sicob.

ITT's CGCT subsidiary will be showing the full line of Unimat telephone switching systems, which range from the 4020 supporting up to eight lines and 32 extensions, to the 4080, which takes up to 400 lines and 2,000 extensions. Post Office regulations preclude ITT from offering any but the 4080 in the UK.

Intel will be offering the 80/30 single board computer and will also feature the new 8088 16-bit

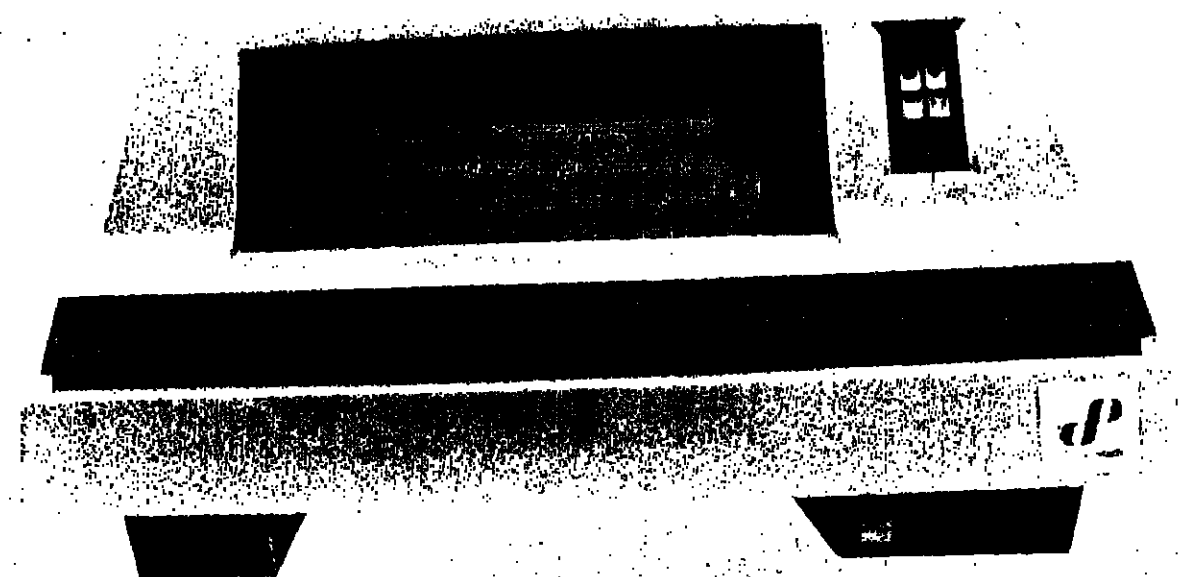


Among the peripheral manufacturers at Sicob will be Data Recording Equipment from the UK, claimed as Europe's largest supplier for OEMs. There will be a full range of DRE equipment on show including the 4000B 12 Mbyte twin platter disc drive seen here on the production line at Salinas.

micro for the first time at Sicob. Facit, exclusive European distributor for Qume products, will introduce the Sprint 5 daisy wheel printing terminal, which runs at up to 35 cps and sends and receives at 1,200 bps.

General Automation will be promoting the 220 DPS data entry system based on the GA 18/220 microcomputer, and will also feature the 16/340. A small-scale telephone switching system, taking eight to 32 exchange lines and 50 to 200 extensions, and called the TLC 7, is on offer from Jeumont Schneider for the first time.

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US industry boosted by defence budget

HESH WIENER REPORTS FROM NEW YORK

THE computer industry, along with electronics and communications, was the recipient of a substantially increased value of US Defence Department contracts during fiscal year 1977, according to a study just published in New York. Among the big gainers were IBM, Texas Instruments and Sperry Rand.

The study, a review of America's top 100 defence contractors, cites government figures that show the Carter Administration's planned spending for research and development as well as production crossed the \$50,000 million barrier during the past year. The total value of contracts during fiscal year 1976 was \$42,000 million.

Among the computer manufacturers, IBM made the most dramatic gain in defence contracts. In fiscal year 1976, the corporation was the 30th largest US defence contractor, receiving a total of \$255 million, equal to 1.5% of its revenues, from the military. This past year, IBM got \$347.1 million in commitments from the same source, making it the 17th largest defence contractor. That sum represents 2.9% of IBM's revenues.

Honeywell managed to get its allocation from the Defence Department raised to \$467.7 million in fiscal year 1977, up from \$385.7 million the year before.

Pan Am network gets British-made VDUs

BRITISH-MADE telegraph compatible visual display units are replacing electromechanical teleprinters in Pan Am's Heathrow-based message switching network covering Europe and the Middle East.

Initial installations in London, part of an £280,000 order for 30 ATS VDU units, have enabled Pan Am's 16 operators to handle 3,000 messages a day, said to be a considerable increase partly caused by the new stand-by tickets.

Further units will be installed in Paris, Rome, Frankfurt and

Delhi, building up to a total of 250 in the company's Atlantic Region, all inter-linked through the STC ADX 6360 message switch at Heathrow.

Should Pan Am decide to standardise on the VDU display in its New York and Hong Kong-based networks, it would need another 600 units, a total of 22 million to ATS. Advantages of VDU units, teleprinters include easier editing and correction of messages before transmission, and much faster transmission of 2,400 bps instead of 100 bps.

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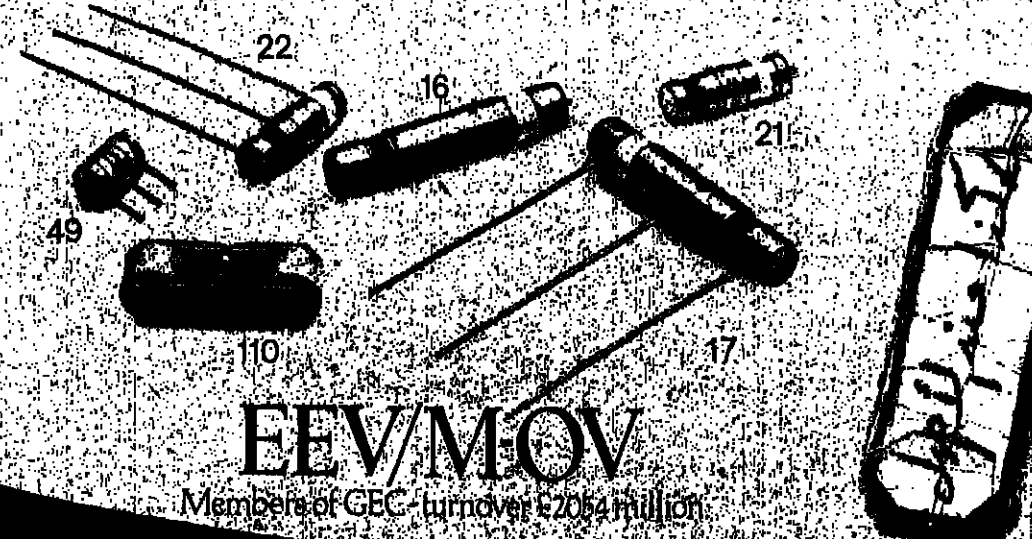
totally at very modest cost.

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EEV/MOV
Members of GEC turnover £200 million



A feature of the Ferranti Cetec stand will be the PDA enabled systems which are designed for a wide range of applications. Also on the stand will be some basic software for graphics generation and the user interface.

THE M-OV VALVE PORTO HAMMER WITH PDA ENABLED SYSTEMS WHICH ARE DESIGNED FOR A WIDE RANGE OF APPLICATIONS. ALSO ON THE STAND WILL BE SOME BASIC SOFTWARE FOR GRAPHICS GENERATION AND THE USER INTERFACE.

Bank of America counters go live

THERE is a bank in the US which has installed a counter terminal network. It captures much of the day-to-day data required to update its files at the point of transaction, records it all on disc — and then scraps it. It may sound like the subject of joke, yet, not only does the bank exist, it is the world's largest.

"We never intended to do it any other way," insists Stephen Ernst, one of Bank of America's vice-presidents in the data processing services department.

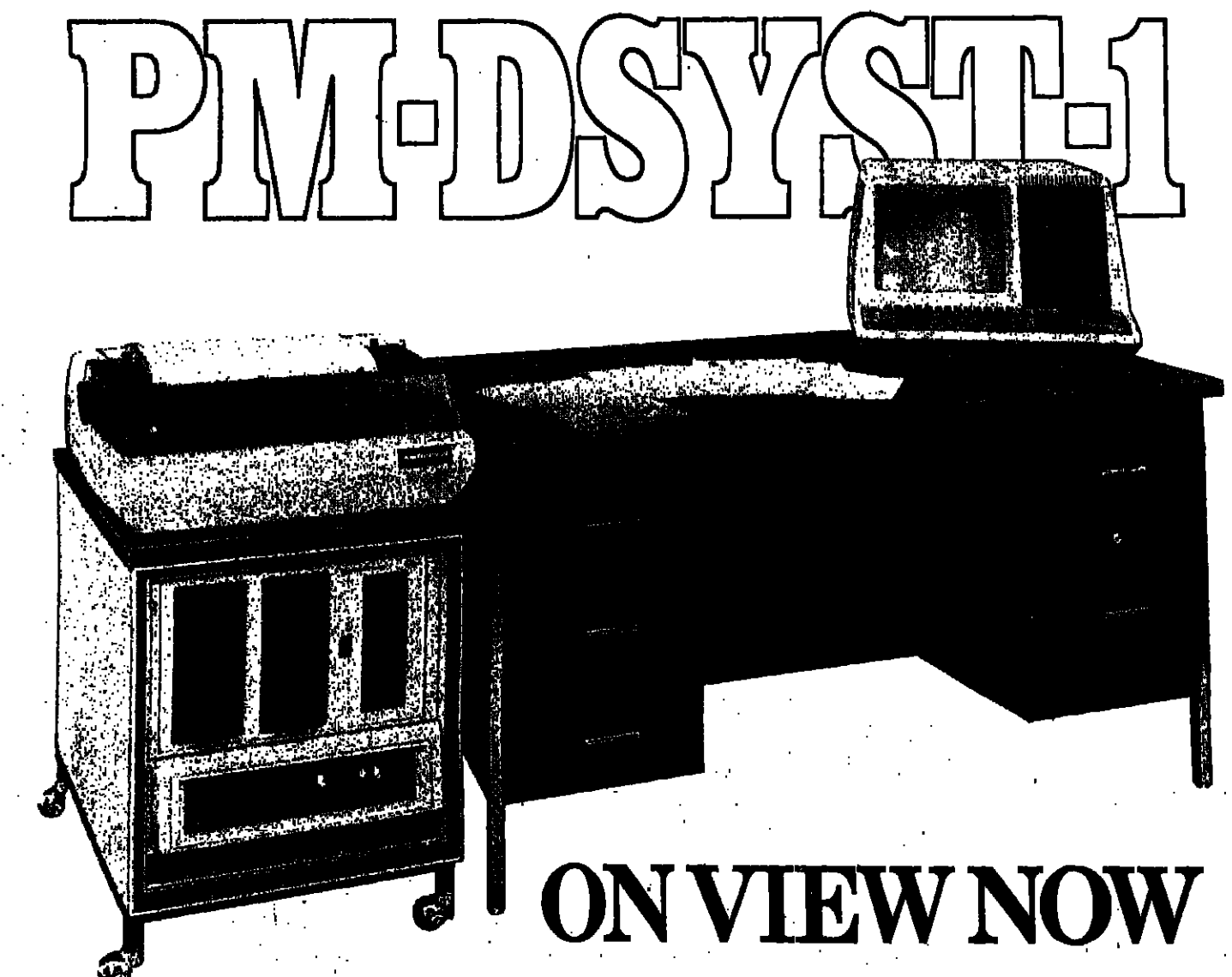
"The tellers do not enter all the data on the cheque, and the present system could not handle it if they did. The system is cost-justified on the basis of the tellers' time which it saves. One of the main reasons for implementing the system was to improve the service we offer our customers, and it enables us to process more customers per hour than we could previously. Another advantage is that tellers no longer have to leave the counter to get account information."

Bank of America decided, in 1968, that it needed to provide some kind of online support to its branches.

"The introduction of batch computer processing put the clerical people in the branches in a worse position than they were in before the days of data processing," says Ernst.

"By 1973, our calculations showed that a teller terminal network would be cost-effective."

"We put out a specification for a terminal sub-system which would have some local intel-



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To allow you first hand experience of this remarkable development, Plessey have arranged a series of "hands-on" demonstrations around the country.

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If you know in advance that you will be coming, try to let us know. Telephone Mrs George or Mrs Wilson. Otherwise just come along, we shall be very pleased to see you.

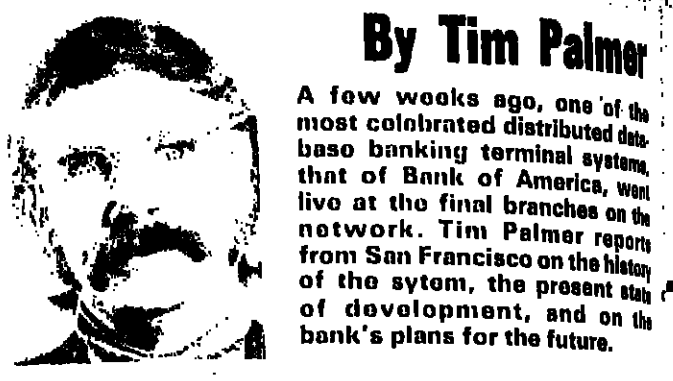
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By Tim Palmer

A few weeks ago, one of the most celebrated distributed data base banking terminal systems, that of Bank of America, went live at the final branches on the network. Tim Palmer reports from San Francisco on the history of the system, the present state of development, and on the bank's plans for the future.

an initial study of what they called a Distributed Computing Facility. The results of the study indicated that by using minicomputers, we could build a lower cost system which would give more reliability and easier growth."

Board approval was sought for the 1968, and also for a test model of the minicomputer alternative. Five companies were asked to submit proposals for a test model of the distributed system, and the initial contract was won by General Automation in April, 1973.

"By October, GA had a working feasibility model up and running," says Ernst. "The board granted approval for the mainframe system, and also agreed that the GA system be turned into a production model."

"IBM did not put in a bid, and DEC was ruled out because it wanted to farm out the system software to another company, whereas we wanted it done by the supplier."

"There were 11 bids, and five met our requirements. The five were Honeywell, NCR, General Automation, Modcomp and Fujitsu of Japan."

"General Automation was the cheapest, and thus won the contract."

Thus, the Bank of America Computerised Office Online System, Cools, was born. GA did the system software, with assistance from the bank, and Bank of America did the applications software.

"We started installing pilot terminals, supported by the IMS/DC control software on 370s while Cools was under development, and half the branches were on that system before Cools was ready," says Ernst.

"We patched it together using our existing batch hardware and moving the system around dif-

All the normal hours transaction records are scrapped at the end of the day, and the mainframe files are updated overnight from the cheques and deposit slips which are delivered to the computer centres.

ferent machines as necessary."

The fundamental unit of the system is the module, and each module consists of four GA 16/440 minicomputers.

The four minis are linked in an H arrangement, with the back two minis, at the top of the H, used as file handlers while the front two handle messages.

Bank of America has two main computer centres, one in San Francisco and the other in Los Angeles, and there are currently six modules installed at each centre. One module acts as a Network Operations centre at each site, and no component in the system is run at more than 50% of its rated capacity. If one mini in a module fails, its neighbour takes over; if one module fails, the next one takes over, and if one whole centre goes down, the other centre can support the whole network.

There are two 9600 bps SDLC lines between the centres.

Four of the six modules at each centre handle checking and savings account inquiries, and one handles online data entry; each module is designed for eight transactions a second, and they are presently running at six a second. Each module is backed by 200 Megabytes on disc, and carries the files for the branches to which it is dedicated; the bank has 1,100 branches, and there are over 8,000 terminals installed at present.

The system software was written in GA assembler, and the applications software in a proprietary macro language.

"We plan to begin using Cobol and Pascal next year," says Ernst, "but we felt it unsafe to use high-level languages to start with because we were unsure how much core we would need."

The original plan was to use asynchronous communication, but a study of SDLC and of X25 indicated that 20% better utilisation would be achieved with an SDLC-type protocol.

"We used IBM's 1974 definition of SDLC, but made a con-

PT 7
The other terminal for IBM and ICL mainframes
FERRANTI

International PTTs hold key to telecoms growth

TECHNICAL problems relating to the growth of data communications services can be solved, but the real brake on international developments is more likely to come from a failure of telecommunications authorities to develop agreements quickly on standards, tariffs and other policies and strategies.

That was a central theme which emerged from a two-week NATO Advanced Study Institute conference of telecommunications specialists which ended last week.

Over 80 delegates from Europe and North America attended the conference at the Chateau de Bovas in the south of France, and organised by Dr Ken Beauchamp, director of Lancaster University computer services, and Dr Jack Howlett, chairman of the National Committee on Computer Networks.

Professor Peter Kirstein of University College, London, put his finger on the nub of the problem when he opened the first session.

Standards, he said, are a key area. There would be a growing need to link private networks to public networks and to interlink public networks in different countries.

But he posed the question: Who has the power and who has the will to force the necessary agreement?

"Yesterday's experiments are today's services and today's experiments are clearly signs of tomorrow's needs," he said.

And if delegates failed to realise the significance of this, Dr Helms, of the Ispra research centre in Italy, discussed some of the major current "experiments" in the European public telecommunications scene, such as Euronet, EILN and the European Space Agency projects.

Although co-operation between European PTTs is good, he said, it would take "a lot more talking" before a full around-the-clock service was possible.

Some of the problems awaiting international and national solutions were outlined by Ray Feldman, of the British Post Office. These relate to topics such as data ownership, operational needs and transnational data flows, needs for standardisation and tariff agreements.

One new area in which this need was becoming particularly urgent is in satellite and packet radio computer networks.

But time and again the discussions returned to the dilemma that, while technical advances continue to be rapid, policy agreements lag behind.

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Ford links-up to Cyber

DESIGN engineers at Ford can now link in to a new Control Data Cyber 176 based at the Dearborn Engineering and Research Centre near Detroit. The new system, which replaces an IBM 650 that has been in service since 1957, will service 85 locations throughout Europe, and US and Asian locations.

Among many new facilities available to the engineers using the new system will be colour video displays indicating stress points on vehicles under design. The system will thus allow quick identification of areas where weight can be saved or where additional rigidity might be needed.

'Regulatory regime will inhibit electronic message systems'

THE regulatory mechanisms developed to monitor and control Electronic Message Systems are likely to inhibit the growth of such services.

That is the conclusion of a report prepared for the US Federal Communications Commission by Kalba Bowen Associates of Cambridge, Massachusetts in conjunction with the Centre for Policy Alternatives at the Massachusetts Institute of Technology.

In Europe, the report suggests, electronic message services are likely to become part of the State PTT monopoly, but in the US it could lead to the opening of mail services to private enterprise.

Echoing the Nato communications conference (see above), the report believes that, whatever regulatory method is chosen, the limits to growth of the services will relate to administrative and management issues rather than to technical developments.

"The prospect that computer terminals will become the printing press of the future and data networks the medium through which the creation and dissemination of ideas takes place is certainly foreseeable," states the report.

"In that event, some future users of the medium will, we expect, find the regulatory regime inhibitory to their purposes..."

The report warns the FCC that regulations of this nascent technology could become almost impossible "if or when EMS moves from being a specialised business service to being a major means of social expression and communication."

Furthermore, the report con-

tends, the US Postal Service will not play a major role in the widespread development of EMS services, "for institutional and policy reasons, including an unwillingness to duplicate the work of private enterprise, and a lack of R&D capability."

Although it is "unlikely" that the USPS will provide more than selected EMS services, the report says, the siphoning off of much traffic into private electronic channels would adversely affect postal unit costs and postal deficits.

The report urges the FCC to undertake immediately additional studies on such specific areas as the likely costs and capital requirements of establishing public, nationwide EMS services; the economic effects of EMS services offered by existing or new carriers on other carriers and services and the international issues raised by EMS.

"The 300-page Electronic Message System report is available at \$30 per copy from Kalba Bowen Associates Inc., 12 Arrow Street, Cambridge, Massachusetts 02138, US.

US tests computer generated mail plan

A SERVICE called Electronic Computer Originated Mail, Ecom, which should enable letters to be delivered to almost anywhere in the US within two days, is to be tested by the US Postal Service in co-operation with private contractors.

If Ecom goes live, organisations using the service will transmit computer generated letters and address lists to a contractor specialising in mail dissemination. The contractor will then transmit the letters over his network to the relevant Post Offices anywhere in the US.

At each Post Office they will be printed out, put into envelopes and delivered by the Postal Service as part of the first-class mail.

One firm understood to be interested in being a mail dissemination contractor is Western Union.

The US Post Office wants private sector firms to operate Ecom networks because the electronic movement of information is not within its present mandate. However, in the longer term it could introduce its own electronic mail service and is currently evaluating equipment.

There are also plans to start experimental electronic mail transmissions between the US and Europe early next year (CW, June 15).



Most companies buying computers don't know what they are doing

Recent surveys show that more than half of the companies buying computers have contacted only one manufacturer. This is strange, taking into account how large their investment is. Because we do not believe that anyone can be sure of the right choice without knowing what other firms can offer.

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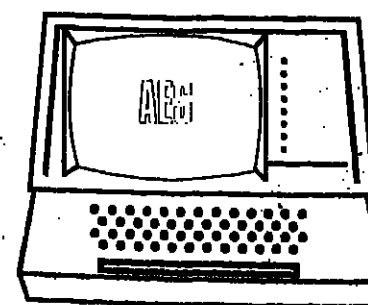
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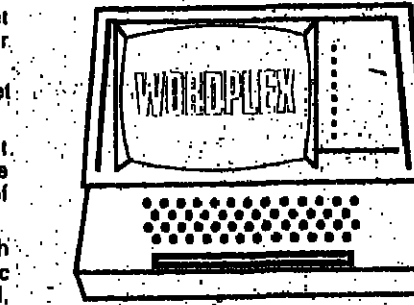
AES Wordplex is looking for Systems Analysts and Analyst/Programmers with a thorough grounding in data processing techniques, experienced in either mini-based or key to disc systems, and/or customer support. A knowledge of O&M fundamentals, whilst not essential, would be advantageous. Successful applicants can look forward to a progressive career with a company which appreciates and rewards ability, and uses it to the full.

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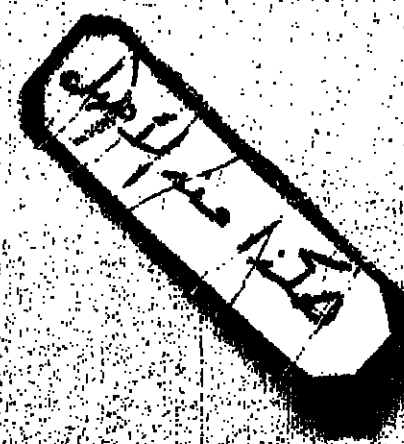
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NEXT WEEK NORTHERN RECRUITMENT FEATURE

Advertisers are reminded that the next Computer Weekly area feature will be published on September 21 and will highlight career opportunities in the North.

Space reservations should be made as soon as possible to:

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Copy Deadline: PM Friday before

COMPUTER WEEKLY

THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

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A E Perry FCA, Olympia Business Machines Co Ltd,
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Ref. No. CW/9/2

CONTACT: David G. Wade on 061-833 0427, or 0785 56013 after office hours.

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Computing Services Association

UNIVERSITY OF KENT AT CANTERBURY

FACULTY OF SOCIAL SCIENCES
PERSONAL SOCIAL SERVICES RESEARCH UNIT

RESEARCH FELLOW IN COMPUTING

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The Research Fellow will be responsible to the Director of the Unit, Professor B. P. Davies. He/she will be expected to participate in data analysis as well as advising the Director on the design development and implementation of systems for computer handling in all the activities of the Unit including new and special surveys and projects.

Salary according to qualifications and experience will be within Range 1A or 1B of the Research and Academic Staff scale C383-C7764.

Application forms and further particulars may be obtained from Mr. V. Prescott, Senior Assistant Registrar, The Registry, The University, Canterbury, Kent. Completed application forms (three copies) should be returned not later than Friday, 13th October, 1978. Please quote reference number A33/78. Informal enquiries should be made to Professor B. Davies.

TIME TO RELAX!!

Summer in our Company is Unique. For two entire weeks the Computer Department transfers, unofficially, to the Stewards' Enclosure and does fundamental research on:

- (1) How a glass of Pimm's converts old men into young boys, complete with school blazers!
- (2) The effect of a given amount of this Unique Youth Drug on the performance of Computer Depts.

This effect can be truly amazing. This year, for instance, a thoroughly youthful and naive DPM believed our REP that conversion from an IBM 3-15 to a 370-125 was SIMPLE!

Hence this Autumn we urgently need an assistant DPM who has a thorough knowledge of low end 370 machines and at least a working knowledge of 3-15's under CCP. The rewards are tremendous (Pimm's, Henley and Michael Parkinson's local cricket team) and the pay is not bad either!

(By the way, we also need a junior programmer — so if you know RPG 11 and can row a bit — please ring our consultants)

KEY COMPUTER PERSONNEL
01-449 3180

68 COMPUTER SERVICES.
CWS Computer Group

Project Manager 1900/2900 Operations Manchester based up to £9000

CWS Computer Group operates a network of ICL mainframe computers, at the centre of which is currently a 2 x 1904S installation, to be replaced in late 1979 by 3 x 2960's.

We wish to appoint a manager with extensive operational experience to take overall project responsibility for the planning, installation and transition from 1900 to 2900, both hardware and software. He/she will have full project authority reporting directly to the General Manager, CWS Computer Group. On completion of this project assignment the appointee will take up a senior line management position within the Group. Experience of either transition/conversion to 2900 or conversion from one manufacturer's equipment to another and a proven record of management achievement would be best qualified for this exciting and demanding job.

If you believe you have the management skills, the experience, the drive and dedication necessary to ensure the successful completion of a project of this nature, then contact immediately: P. J. Cropper, General Manager, CWS Computer Group, New Century House, Manchester, M80 1ES. TEL: 061-834 1212 ext 6820 (office hours) 061-834 728 (evenings)

National Coal Board Mining Research and Development Establishment

The expanding programme of the Establishment covers research, development and testing in all fields of science, technology and operational techniques applicable to coal mining. This year the Establishment is recruiting scientists and engineers to increase its effort in key areas of mine productivity and safety.

There are a number of new posts for

COMPUTER SYSTEMS ENGINEERS

MINOS is the standard colliery process control mini-computer system developed at MRDE. Work is in progress to develop a range of applications at collieries in conjunction with a number of systems suppliers.

Vacancies are available for engineers with particular interest in the following fields: software standards and production; safety aspects; application development; system maintenance; multicomputer system development; compilers and operating systems; communications aspects; documentation and information systems.

Applicants should have a degree in computer science or in an engineering or science subject and have practical experience of program development in process control systems for industrial applications; experience of RSX11 and CORAL 66 would be an advantage.

The starting salary for these posts will be according to qualifications and experience in the range £3,800 - £6,500. Excellent benefits include nearly 6 weeks annual holiday.

Please apply to the Staff and Administration Manager, quoting reference no 750.

National Coal Board,
Mining Research and Development Establishment,
Ashby Road, Stanhope Brethby, BURTON ON TRENT,
Staffs, DE15 0QD.

NCB

MINING RESEARCH AND DEVELOPMENT ESTABLISHMENT

INNER LONDON EDUCATION AUTHORITY
LONDON COLLEGE OF PRINTING
SCHOOL OF SCIENCE AND TECHNOLOGY
SENIOR LECTURER IN COMPUTER TECHNOLOGY AND INFORMATION SYSTEMS

The Senior Lecturer is required from 1st September, 1978, or as soon as possible thereafter to lead developments in Computer Technology in the College.

This is a particularly challenging post to those who have the necessary drive and enthusiasm, both to be responsible for computing throughout the College and to identify and expand those areas of the College's work when computing is applicable.

The successful candidate should ideally be a graduate in Computer Science and/or a member of the British Computer Society and will be capable of teaching within Honours Degree programmes and furthering research in this area.

Appropriate industrial experience would be advantageous. Salary in accordance with Burnham F. 2. Report C851-C1065 (part) £2752, subject to formal approval, plus 002 Inner London Allowance.

Further details of the post and an application form, returnable within 14 days may be obtained from the Senior Administrative Officer, London College of Printing, Elephant and Castle, London SE1 8SB. Tel. 735 844 (Ext. 227).

THE UNIVERSITY OF MANCHESTER
DEPARTMENT OF ORTHODONTICS
RESEARCH ASSISTANT IN COMPUTER GRAPHICS

Applications are invited for this three-year post. Duties will include the computer programming of orthodontic formulae related to the analysis of skull X-ray pictures and the clinical diagnosis and treatment of patients with facial deformities. Applicants should have computing experience including proficiency in Fortran, a mathematics degree and a good knowledge of statistics.

Further particulars and application forms (returnable by September 28th) from the Registrar, The University, Manchester M13 9PL.

Ref. CW/29/2

Hutton

SPECIALIST RECRUITMENT CONSULTANTS

Tameside Metropolitan Borough

Computing

PROJECT LEADER

PO1C £8813-£7230 p.a. Inclusive of supplements

To be responsible for one of three teams of analysts and programmers and reporting to the Development Manager. Candidates will have drive, initiative and the ability to motivate their team in addition to a high level of expertise in systems analysis and design.

SYSTEMS ANALYST

PO1A £6727-£6342 p.a. Inclusive of supplements

As need in priority to the Project Leader candidates should have designed and implemented computer systems. Applicants with a programming background and knowledge of systems procedures will also be considered.

SENIOR PROGRAMMER

AP1A/PO1 £4581-£3888 Inclusive of supplements

Applicants should be ICL 1900 series Cobol programmers preferably with George 3 or communications experience. This successful candidate will work on one of three project teams and be expected to assist with the supervision of more junior programmers.

TRAINEE PROGRAMMER

Up to £3661 p.a. Inclusive of supplements

Applicants must have a sound academic background. Appropriate training in Cobol will be given if necessary.

The starting salary paid in all cases will depend on qualifications and experience. The Computer Centre, based in Ashton-under-Lyne, comprises a 128K ICL 1903 running under Dosage 3, for which further enhancements are planned. There is an ambitious development plan which includes development in database techniques and VDU based systems.

Fulltime working hours and assistance with relocation expenses will be given in appropriate cases. Please come or telephone for a job description and application form (to be returned by 28th September) to the Chief Personnel Officer, Meridian House, Meridian Way, Ashton-under-Lyne, Greater Manchester, Tel. 061 330 8385 Ext. 2.

FIELD SERVICE ENGINEERS

NEW CAREER START c £5,500

(Plus overtime + standby allow, + car + training)

One of the World's leading Micro/Mini Computer manufacturers are about to establish a new branch office — this could be your chance to get ahead with prestige products with world-wide acclaim — they offer a generous starting salary + car + bonus and other benefits. If you are a bright Young Service/ Customer Engineer with good academic background / electronics experience and living in London or Home Counties, then take a big stride forward to an exciting new career with excellent future prospects by calling today ... but hurry! Ref. EK 2056 (Consultants).

AB EXECUTIVE (KINGSTON) LTD. 01-546 9473

ANALYSTS PROGRAMMERS OPERATORS

ANALYSTS & PROGRAMMERS LEEDS £4500 to £7000
IBMs and Large Minis for Time Sharing and On-Line development. (Peter)

OPERATIONS SUPERVISOR LONDON SW1 to £5000
Female or Male, In-House Min. (David)

SYSTEMS PROGRAMMER N/NW LONDON to £7000
Installation Software Support. Byte based experience please. (Peter)

SCIENTIFIC/TECHNICAL PROGRAMMERS SOUTH COAST c. £5500
Mini Assembler or Fortran, Process Control, Real Time, Simulation. Opportunity for foreign travel. (David)

PROJECT LEADER SOUTH MIDD. to £7500
Project Leading and Business/Financial experience. (Peter)

SENIOR PROGRAMMERS LONDON W2 to £6000
ICL Cobol for On-Line Text Processing. (David)

OPERATORS SOUTH MIDD. £3600 to £5400 incl.
From 2 months' exp. to 2 years' OS/VS1 at top end. (Peter)

COBOL PROGRAMMERS SOUTH MIDD. c. £4850
1 year plus any Cobol for On-Line Installation. (David)

COBOL PROGRAMMER WEST END to £6000
Come and learn more about T/P and Database. (Peter)

ANALYSTS or ANALYST/PROGRAMMERS ESSEX BORDER c. £6400
(David)

MIS development work. Relocation.
TELEPHONE: 01-839 6087

Peter Barson Barnard, Davies & Ward Ltd.
(Even. & Weekend 0702-521621) Computer Personnel Consultants

David Ward 107 Jermyn Street, London, SW1Y 8EE
(Even. & Weekend 0293-36880)

DAVIES & WARD LTD

ASSISTANT TO COMPUTER OPERATING SUPERVISOR

c. £4000

Due to expansion a position has arisen in the In-House Computer Department of our new 110 building administration offices for an experienced Computer Operator to assist the Computer Operating Supervisor.

The successful applicant aged 22 or over will have had one year's work experience preferably including NIXDORF equipment and will have a responsible outlook in his/her work.

Working in an installation including NIXDORF PDP11 and DATAPOINT equipment, the main function will be to correctly process daily work schedule as supplied.

Basic hours of duty will be from 12 noon to 8 p.m. Monday to Friday, which will require an ability to work on own initiative.

As well as a good starting salary, we offer excellent working conditions, pension, the assistance discount scheme, an excellent subsidised staff restaurant and a planned first class social club.

For application form please apply Mrs. S. Parker
CHARRINGTON & COMPANY LIMITED
Anchor House
Mile End Road, London, E1 4BL
Telephone: 01-750 1860



Charrington

TEMPORARY COMPUTER PROGRAMMER

Up to £5,253 p.a. (full-time)

Experienced programmer with practical knowledge of PL/I, COBOL and I.C.L. Software is required (preferably full-time) to cover approximately one year's absence on maternity leave for our I.C.L. 2903 28K computer with discs, tapes and other enquiry systems.

Write to the Personnel Officer, Manor House, Tuners Wy, Cheshunt, Herts., EN8 8JL for application forms to be returned by 21st September, 1978.

BOROUGH OF BROXBORNE

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring Ian Carter for further details on 01-261 8016



IBM OPERATOR TARGET EARNINGS c £6,500 +

C. & A.S., a West End Computer Bureau, require a high calibre Operator who wants to be part of an efficient, energetic team.

The Operator we want should be looking towards a career at the 'sharp-end' of D.P. with technical, client and people involvement.

- ★ Basic salary inc. S/A up to £4,500 p.a.
- ★ Overtime c £2,000 p.a.
- ★ 3 shift system Monday to Friday.
- ★ Season Ticket Loans.
- ★ Profit Sharing.

If you have 12-18 months' IBM DOS, good technical knowledge and want to progress, contact CAROL MCGOVERN on 01-836 6775.

Computer Personnel International

110 St Martin's Lane, London WC2N 4BH 01836 6775

FOR CLASSIFIED ADVERTISEMENTS IN COMPUTER WEEKLY

Ring Eddie Farrell or Mark Williams
on 01-261 8028
01-261 8019.

COMPUTER ENGINEERS U.K. - O.S.

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All systems go
£4,500-£14,000 p.a.
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★ shift
★ overtime
depending on post
and experience
E.M. STACE & ASSOCIATES
100, Victoria Road, London, W14 9JL
Tel: 01-836 6775

OS CONVERSION AMSTERDAM

£250 p.w.

We have an urgent requirement for operations staff to assist with an IBM 370 DOS to OS systems conversion. Applicants must have a thorough knowledge of OS VS1, JCL, and utilities.

Conversion experience will be preferred. Successful applicants will help to train the clients staff.

Salary will be in the range of £200-£250 p.w. Long contracts will be offered.

Please telephone Denise Ross at
KEY OPERATIONS ASSISTANCE LTD
4 Half Moon Street, London, W1
01-483 6757

Analyst/Programmer Real-Time Applications

This position offers you the chance to be involved in the introduction of on-line systems from the very start. Located in Leicester this independent brewery is expanding its varied computer applications and you will be a key figure in their development.

Probably aged in your mid-20's you should have worthwhile Cobol Programming experience on 1900/2900 machines. Real-time experience is highly desirable as is experience of implementing on-line systems, preferably on a 2903/4. The conditions of employment are excellent and the department being only a small one at present will give you every chance to be widely involved in its activities. Your salary will be related to relevant experience but could range from c £4,500 to c £8,000.

PER Professional & Executive Recruitment
Contact: Christine Phillips, PER
177 Charles Street, Leicester
Tel: (0533) 536321
Applications from both men and women are welcome.



(A member of the Unilever Group of Companies)

OPERATIONS MANAGER

to £6,400

Applications are invited for the above position. Requirements include knowledge of OS JCL, staff supervisory experience and a general understanding of how the operations function interacts within the computer department.

Duties include management of the terminal operations team, ensuring that live applications run to schedule, and control of application packages. In addition, a significant degree of user contact is anticipated regarding operations systems and ad hoc requirements.

This position would appeal to people wishing to develop their career within operations and who would welcome a broad involvement in the department's activities.

Current computer systems are run via a network of remote batch terminals linked to IBM/ITEL mainframes at the Group's computer centre.

Facilities include: staff shop; canteen; sports and social club.

Write giving brief details of experience, age, etc. to:

Mr. B. E. Oakley, Computer Services Manager
The Wall's Meat Co. Ltd.
Market Road, South, Middlesbrough TS2 4AB

Situated in London's Green Belt, and with a significant lead in the expanding Telecommunications field, our client is currently at the forefront in developing micro-processor based private telephone exchanges which will broach new ground in many areas. Facilities previously unavailable will be offered, many as standard features, with the options of flexibility and expansion built in. The micro-processing techniques involved require the expertise of programmers in both high and low level programming languages, and in areas as diverse as Real Time Communications and Hardware Testing.

Real-Time Communications Programmer

£5000 to £7500 Neg

Being the largest section involved in the Private Telephone Exchange project, it is only natural that the Real-time Communications team should have both the greatest need of expertise and the most to offer in return.

There are vacancies for several programmers with a minimum of around two years' experience in either ALGOL, FORTRAN, CORAL or ASSEMBLER - Level languages. Ideally, experience should have been gained in a Telecommunications environment but we would also like to hear from people with experience of either traffic or process control, or from an aerospace or engineering environment; however if your work has not been in any of these disciplines don't exclude yourself - this is a team venture in which personality and potential are every bit as important as experience. Responsibility will come quickly to successful applicants and, with a clearly defined and well-planned career structure, so will promotion to those of real ability. Also, since this section takes responsibility for software development in the whole of Europe and the U.K., opportunities for overseas travel may be expected to arise from time to time.

Datascene Recruitment Ltd
Sceptre House
169-173 Regent Street
London W1R 7HB

01-439 7871
24 hour answer phone

Analysts/ Programmers

Increase your earnings and secure your future with CMG!

CMG pays top whack

by Roger Green

If you want a well paid job, work for CMG Computer Management Group.

The Company has just been named as the fifth highest wage payer of the top 1,000 private companies in the UK, with an average annual salary of £5,174 for the year ending last May.

According to the Jordan Dataquest survey 'Britain's Top 1,000 Private Companies 1977', CMG is also the fourth most profitable private company in the country.

A CMG spokesman suggested that the reason for the high salary rating was because 'one of the policies of the company is to attract the best people. To do that you have to pay the best money, and this has been our policy since we began.'

CMG was started in 1965 with an original investment of £1,500 and has grown to be a four country computer services group with an annual turnover for its last financial year of nearly £7 million.

The complete absence of other computer service companies appears to be because most of the large ones are part of groups - as are ROC Datasolve and Scicon.

Only one computer manufacturer makes it into the Jordan chart - Computer Technology, at 981st position with a more modest turnover of about £4 million, but no figures available for average salaries.

Ferranti, which makes computers as a comparatively small part of its operation is the 8th largest private company and enjoys the distinction of having the second highest annual wagebill - £41.2 million.

However, the average Ferranti salary has far to go to catch CMG - it is a mere £2,643.

COMPUTING
JULY 6 1978

PLUS

- * Free Life Assurance & Pension Plan
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- * 21-26 days annual holiday
- * Profit sharing
- * Holiday commitments honoured
- * Removal expenses paid

Experienced computer professionals are required at all levels within CMG.

If you are earning between

£4000-£12000

and want to develop your career with a company committed to growth, complete the attached application form and send it to one of the CMG Subsidiaries shown below.

Jane Leiper,
CMG Computer Management
Group (Middlesex) Ltd.,
Westway House, 320 Ruislip Road East,
Greenford, Middlesex UB6 9BW
Tel: 01-578 4563

Janet Stirling,
CMG (Scotland) Ltd.,
Highland House, 58 Waterloo Street,
Glasgow G2 7DA. Tel: 041-221 8193/6

Judy Wilson,
CMG (Southern) Ltd.,
Sunley House, Bedford Park,
Croydon CR0 2AP. Tel: 01-686 8251

Janet Gothard,
CMG (West End) Ltd.,
Sunley House, Bedford Park,
Croydon CR0 2AP. Tel: 01-686 8251
(TO BE RELOCATED IN LONDON)

Colin Smith,
CMG (City of London) Ltd.,
'Eastgate' 73 Leman Street,
London E1 8EY. Tel: 01-481 3881

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Your success story starts here:-

PERSONAL DETAILS

CONFIDENTIAL

(Please print)

SURNAME

FIRST NAMES

ADDRESS

TELEPHONE Nos. HOME

OFFICE/CONTACT

DATE OF BIRTH

MARITAL STATUS

NATIONALITY

DO YOU HAVE A CURRENT DRIVING LICENCE?

PASSPORT?

DO YOU OWN A CAR?

ARE YOU PREPARED TO TRAVEL FOR SHORT PERIODS

UK?

ABROAD?

DESCRIBE THE APPOINTMENT YOU NOW SEEK:

DETAILS OF EDUCATION

SCHOOL CAREER

EXAMINATION RESULTS (subjects and dates)

HIGHER EDUCATION

EXAMINATION RESULTS (courses and dates)

CAREER HISTORY

PRESENT OR MOST RECENT EMPLOYMENT

NAME OF COMPANY

JOINING DATE

JOINING SALARY £

CURRENT SALARY £

POSITIONS HELD (approx. dates) and DUTIES SPECIFYING COMPUTERS USED AND AREAS OF BUSINESS KNOWLEDGE:

PREVIOUS EMPLOYMENT

NAME OF COMPANY

JOINING DATE

JOINING SALARY £

CURRENT SALARY £

POSITIONS HELD (approx. dates) and DUTIES SPECIFYING COMPUTERS USED AND AREAS OF BUSINESS KNOWLEDGE:

PREVIOUS EMPLOYMENT

NAME OF COMPANY

JOINING DATE

JOINING SALARY £

CURRENT SALARY £

POSITIONS HELD (approx. dates) and DUTIES SPECIFYING COMPUTERS USED AND AREAS OF BUSINESS KNOWLEDGE:

OTHER INFORMATION -

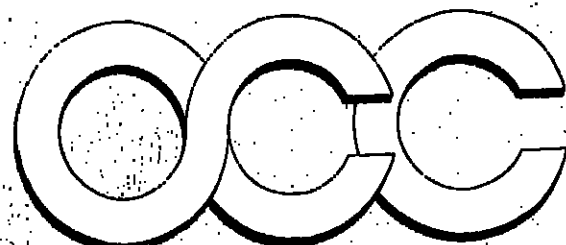
LEISURE, COMMUNITY ACTIVITIES, etc:

ANYTHING ELSE YOU WOULD LIKE TO ADD:

SIGNATURE

DATE

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London · Amsterdam · Frankfurt
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occ computer personnel limited

Euston

Senior Systems Analyst

c £7,500

Large-scale accounting systems

The computer serves the needs of a major public body which handles significant amounts of money, and the accounting systems handle a large volume of accounts and transactions. However, the department is still young and there are plans to design and implement further large systems. New hardware will be required in the future and modern techniques (data base and on line systems) will be used. A Senior Analyst is required to help with the investigation, design, specification and implementation of new systems. The Analyst will have considerable autonomy and must be able, self-motivated and mature to allow him to operate at the most senior levels. Experience of accounting systems, database and on-line techniques would be useful. The hardware background is unimportant. Prospects for career development are excellent and the terms of employment are very good. They include relocation expenses, index linked pension scheme, season ticket loans, etc.

Ref: 741/CW/Neville John.

London Bridge

Senior Systems Analyst

to £7,000

Senior Programmer

c £5,500

New 2904: development of accounting system

A leading manufacturing and publishing group needs a Senior Analyst to deal with an increased workload. The ICL 1902A is to be replaced by a 2904 later this month. The analyst will develop a major accounting package and will lead a small but progressive team of programmers working on both batch and on-line commercial systems. The prospect of project leadership is likely in the near future. Candidates should have at least three years' commercial systems experience and a Cobol programming background. A Senior Programmer with at least two years' Cobol experience, any hardware, is also required. Benefits include flexible working hours, a subsidised restaurant, season ticket loans, staff discounts, and for the analyst a car loan scheme.

Ref: 743/CW/Marian Tabone.

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356, or write to the above address.

If it would be more convenient to telephone in the evening, or weekend, the telephone numbers are: Roger Allington — Berkhamsted (04427) 2299, Neville John — Farnborough (66) 52880, Marian Tabone — 01-565 5568.

TOXES USA

Senior Programmers

Programmers

\$ negotiable

H6000 Series COBOL

A number of opportunities currently exist for COBOL programmers with Honeywell 6000 series experience to work on contract in the USA. Application areas, utilising IDS, include Accounting and Materials Management. Candidates for the senior positions should have a total of 6 years' DP experience including around 2 years on large Honeywell hardware, preferably together with some system and program design experience in the commercial accounting area. Programmers should have around 4 years' experience including some time spent on Honeywell equipment. In both cases experience of IDS, TOS, TSS or GMAP could be very useful. Employment will be offered on a negotiable short or long term contract basis and fringe benefits include paid air fares, sickness scheme, bonus, tax concessions, relocation expenses, etc. Working conditions are excellent. Offices are air-conditioned and the general environment is relaxed and friendly with a wide variety of sports and recreational facilities available in the area.

Ref: 390P/CW/Roger Allington.

Middle East

Analyst Programmers

c £14,000 tax-free + benefits

New department: IBM 370/115: RPGII: CICS: DOS/VS

Analyst programmers are required for a new computer department being established at a leading motor distributor in Saudi Arabia, which is due to take delivery of an IBM 370/115 in March, 1979. The systems will initially be a mixture of batch and on-line, running under CICS and DOS/VS and written in RPGII. Successful candidates will ideally have at least 18 months' practical experience of CICS, DOS/VS and RPG. There will be a high degree of user involvement and the positions will suit self-starters. Experience of the distributive side of the motor trade would be an added advantage. These positions are on bachelor status, enjoying the following benefits: 30 days' leave and 15 days' public holidays per annum. Free furnished accommodation of good standard with free electricity and water. Free medical treatment and company car.

Ref: 739/CW/Marian Tabone.

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Any machine experience
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RING DEREK ASHLEY or
GEOFF CARR 01-402 9355

MARCOL COMPUTER
SERVICES

SUPPORT OFFICER

AP3/4 £4017 to £4917 (including
supplement and London Weighting)

Are you a Shift Leader, Senior Operator or Senior Control Clerk with at least 2 years experience of IBM DOS/VS POWER/VS and currently looking for career advancement in a challenging non-shift role? Then you may be interested in joining our young and enthusiastic operating team, working in pleasant surroundings at Bexleyheath on a recently installed 1 megabyte IBM 370/138 using DOS/VS POWER/VS and CICS with an extensive communication network and Radion R300 data entry equipment.

You will be a member of a small team responsible for providing a general operating support service to the installation and its users, involving the set up and control of all new work from the final stages of system development through to live processing, the preparation of operating procedures and customer liaison functions.

For further details or an application form please write or telephone (01-303 7777 Ext. 782), D. Jarvis, Operations Manager, Data Processing Department, 8 Brampton Road, Bexleyheath, Kent DA7 2EZ.

Closing date: 8 October 1978
Previous applicants need not re-apply

Bexley London Borough

FRANKFURT — BRUSSELS — LONDON — PARIS

PROGRAMMER

C £5,500 + EXPENSES

The world's largest international airfreight forwarder requires two experienced COBOL programmers to help install mini-computer systems in European locations. Based in Sunbury-on-Thames, the work will involve extensive travelling, up to 50% of the time will be spent in Europe, during which time generous overseas expenses will be paid.

Direct experience on minis is not essential as specific training will be given. More important is self-reliance and initiative in successfully working and liaising with our European user departments. The successful applicant will be in a strong position to be closely involved with an expanding department, working towards extensive communications and distributed processing facilities.

If interested write to:

JEFF MALLINDER
Air Express International Agency Inc.
81 Staines Road West
Sunbury-on-Thames
Middlesex, TW16 7AH

or telephone Sunbury (09327) 86912 (Bridford 01-871 71807 (evening))

CAREER DEVELOPMENT FOR ANALYSTS AND PROGRAMMERS

Leicester

There are a number of vacancies at our Leicester based client for professional data processing staff. The installation employs the latest ICL hardware and current developments include database and on-line systems covering a diverse range of applications. Distributed processing applications using mini computers are also being developed.

Applications are invited for the following positions:-

Analysts

c.£5500

Reporting to a project leader these positions offer good experience in development of major systems.

Candidates should have one or two years systems analysis experience and preferably a background in programming.

(c/78084)

Junior Analysts

c.£4700

These vacancies are within project teams and can offer candidates excellent prospects as 'first time' analysts.

Candidates should have about three years relevant dp experience preferably including some supervisory role.

(c/78085)

Senior Programmers c.£5500

These positions involve responsibility for leading a small programming team developing new systems in a project environment. The positions report to the chief programmer.

Candidates should have about three years COBOL experience in a major installation.

(c/78083)

Telephone or write giving brief career details, quoting appropriate reference, to Ivor Norton.
OR ALTERNATIVELY INFORMAL INTERVIEWS WILL BE HELD AT THE CENTRE HOTEL, LEICESTER FROM 9.00 a.m. UNTIL 9.00 p.m. ON THURSDAY 21st SEPTEMBER 1978. YOU CAN MAKE A PRIOR APPOINTMENT FOR THIS DATE OR ALTERNATIVELY DROP IN AND SEE US WHEN CONVENIENT.

Ivor Norton Management Services Ltd

Recruitment Consulting Division

P.O. Box 63, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 66628.

to £16K

TEAM WORK IN THE SOUTH OF ENGLAND

Focus, consultants to the computer profession, are looking for

PROGRAMMERS and a TEAM LEADER

for a one-year contract.

You will be working together as a team, but initially the entries of the various team members will be staggered over several months: the first programmer to start in October, 1978. The unit will gradually increase until it is completed by March, 1979.

To play your part as an essential member of the team, you will be expected to have experience in three or more of the following:
IMS, VMS, TSO, CICS, ASSEMBLER, PL/1 and FORTRAN.

If you have the skills we need, and would be happy working with a close-knit group of professionals based in the South, ring FOCUS COMPUTER SERVICES immediately on 01-487 5781.

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceeding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring Ian Carter for further details on 01-261 8016

UNIVERSITY OF SURREY
Department of Mechanical
Engineering

RESEARCH OFFICER

FOR THE ROBOTICS
GROUP

Applicants are expected to hold either a University degree or HND and have knowledge and experience of microelectronics. The successful applicant will work in a research team developing industrial robots. Main duties will be in configuring and interfacing industrial microcomputers to the robot hardware and maintaining and updating the robot software. The successful applicant will be able to exploit fully ability and knowledge in developing new software in robot assembly or a higher level language and will be able to engage in computer simulation work and control problems concerning robots.

The commencing salary will be £4385 per annum, on the Research & Analysis Staff Scale, Range 15. The duration of the appointment is for 2 years. It is hoped that the successful applicant will be able to commence duties on or before 1st November, 1978.

Further particulars of this post may be obtained from the Assistant Secretary (Personnel), University of Surrey, Guildford, Surrey GU2 5XH, or telephone Guildford 01251, Ext. 482, and to whom applications in the form of a curriculum vitae, including the names and addresses of two referees, should be submitted by 16 October, 1978.

JUNIOR PROGRAMMERS

— £4.5K

A major bureau is looking for two junior programmers to join the customer support team.

The work would entail visiting customer sites and 'hard holding'. The third applicant would have 1-2 years' experience in COBOL or FORTRAN. A company car is provided if required.

Phone: 01-542 8810

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

IBM UPGRADE IN LONDON

COBOL & ASSEMBLER PROGRAMMERS

A SMALL DATA PROCESSING DEPARTMENT, IN CENTRAL LONDON, wishes to secure the services of three IBM PROGRAMMERS to assist with the development of mainly accounting applications and the implementation of a larger 370 to be installed in 1979. The Company is in a period of continued expansion, relying heavily on data processing systems to cope with the increase in demand for accurate accounting information.

TWO PROGRAMMERS, WITH AT LEAST 2 YEARS' IBM COBOL, are required to strengthen the systems and programming group currently engaged on several interesting projects. A knowledge of DOS/VS would be an advantage and the successful applicants will be expected to communicate with accountants and senior personnel alike. Salaries will be according to experience with a maximum of £5,800 per annum.

A SYSTEMS PROGRAMMER, WHO IS SEEKING PROMOTION TO CHIEF PROGRAMMER, will initially be fully responsible for the operating system and all programming support. Candidates will have 4-5 years' IBM ASSEMBLER experience and a knowledge of COBOL will be especially helpful in securing the Chief Programmer position. Commencement salary will be up to £6,800 per annum with an extra £500 on promotion.

The Company offers a NON-CONTRIBUTORY PENSION SCHEME. Lvs. 35 hour week and 4 weeks holiday. Being situated in Central London, it is easily accessible by all forms of transport from the Home Counties.

24-hour answering service

Please telephone for a confidential discussion or write to:
30 Fleet Street, London EC4A 3AA

01-458 4981

EXCELLENT OPPORTUNITIES FOR CONTRACT STAFF

In line with current expansion plans we will be pleased to hear from programmers, analysts and consultants of professional disposition with a solid background in any of the following disciplines:

MARK IV **FORTAN**
COBOL **BASIC**
PL/1 **RPG**
BAL

and any DATABASE or TP MONITORS

Forthcoming internal projects include developments on in-house equipment. Current external projects cover U.K., Europe, U.S.A. and the Middle East.

Please telephone or send career details to:

MARGARET DRISCOLL
TANGENT COMPUTER SERVICES
BROOK HOUSE, 4 EASTERN ROAD
ROMFORD, ESSEX RM1 3PJ

TEL. ROMFORD 0708-44181/2

Top contract fees

SYSTEMS ANALYST

Expanding Canadian construction company requires a systems analyst with flair and resourcefulness to be personal assistant to the data processing manager.

Applicants must have a degree or equivalent and from 3-5 years' experience in business systems and programming. Interviews will be held in the U.K.

The configuration is a P.D.P. 11/70 using R.S.T.S./E. with programming in Basic-Plus. Existing on-line applications include estimating, costing and payroll. The successful candidate will design an on-line sales/invoicing system initially, then moving on to estimating and accounting. The position involves considerable independence and responsibility and will require some travelling to our Calgary and Vancouver branches. The job is located in our new premises in Edmonton.

Starting salary is from \$18,000-\$22,000 depending on qualifications.

JK

Write to:

Data Processing Manager:
J.K. Campbell & Associates Ltd.
1104-1107 Avenue, Edmonton
Alberta T6H 0X8, Canada

Tangent
COMPUTER SERVICES

GRUNDIG

IBM System 3-15B

Grundig International are the marketing subsidiary of Grundig AG, distributing quality electrical goods throughout the UK. We are undertaking a long-term project in which our conventional computer-related systems will be streamlined, thus creating a coherent and flexible organisation to meet future market demands.

Programmer / Analyst c. £6,000 p.a.

To strengthen our development team we have created a new position for an experienced RPG2 Programmer/Analyst. He or she will be responsible to the EDF Manager for the design and full implementation of the planned systems which will include on-line inventory control/distribution and associated budgetary costing.

Senior Computer Operator c. £5,250 + p.a.

In order to assist in the implementation we also have a vacancy for an experienced operator to control the daily processing requirements. The successful candidates will have the initiative and self-motivation to develop the scope of the positions by introducing Company-wide systems in the area of data communications. The excellent remuneration packages will reflect the high level of contribution expected from the applicants. To discuss your ambitions and prospects with us please telephone

The Personnel Officer,
Grundig International Limited,
Newlands Park,
Syrdenham, SE.26
Telephone: 01-659 2468

Computer Operator

SHIRLEY, SOLIHULL

The Region currently operates a 192K 1903T running under GEORGE 3, with two front end processors supporting a mixed batch/communications workload. A 2903 system is also installed. Future developments include the replacement of the 1903T with a large 2900 configuration.

Shift working is involved. Salary range including shift allowance £2,855-£4,499 per annum. A self-financing bonus is also payable.

If you think you have the right level of experience to join a go-ahead team, please write, quoting vacancy number CW235/78MR giving details of age and experience to the Personnel Manager, Central Electricity Generating Board, Haulucka Green Road, Shirley, Solihull, West Midlands, B90 4PD, by 21st September, 1978.



CENTRAL ELECTRICITY
GENERATING BOARD
Midlands Region

Ludbrook

RECRUITMENT CONSULTANT

An excellent opportunity exists within our expanding D.P. division, for a dynamic male or female, who is able to communicate at all levels, with confidence. A minimum of 18 months D.P. experience, together with a pleasing personality, and ability to work under pressure is essential.

The rewards for self motivation are high. For further details, please phone in the strictest confidence.

P. BELL
LUDBROOK MANAGEMENT SERVICES
1 East Gates, Leicester
Telephone: Leicester (0533) 52314

PROGRESS & CONTROL ASSISTANT

Leicester up to £4332

This is a key position in the Computer Operations area.

Progress and Control Assistants negotiate short-term work processing schedules with representatives from the departments using computer systems. They are responsible for preparing, submitting and progressing computer runs in line with these schedules to ensure that the required work deadlines are regularly met. They must maintain contact with both Computer Operating staff and the user representatives on the current work status. Additionally, they must make sure that the manual checks and controls built into each system are stringently enforced.

The successful man or woman must be capable of establishing and maintaining good working relationships with other staff, possess a methodical approach to work and be prepared to work outside of normal hours to ensure work is completed satisfactorily.

Salary in a range rising to £4332 per annum.

Detailed applications, quoting reference number A.201 on both letter and envelope, to:
Senior Personnel Officer (Finance & General Services), Emgas, De Montfort Street, Leicester.

Closing date: 22nd September, 1978.

EMGAS

WEST WILTSHIRE DISTRICT COUNCIL

RPG 11 PROGRAMMER/ ANALYST

**SALARY £5,331 to £5,668 including
all Supplements and Shift allowances**

The Council operates an ICL 2903 computer with EDS 60s and a 7502 based communications network providing a computer service throughout the authority.

The installation is operational between 7.30 am to 7 pm by means of two shifts, i.e. 7.30 am to 4 pm and 10.30 am to 7 pm.

The machine is due to be upgraded to 2904 in late summer and the Council wishes to appoint one experienced RPG 11 Programmer wishing to gain experience in the analysis sphere. The person appointed will have at least eighteen months experience of RPG 11, and a detailed knowledge of ICL 1800 to 2903 Software/Utilities will be regarded as equally important.

If you would like to discuss any aspect before submitting an application form, please contact D. BENFIELD, Computer Manager on Trowbridge (02214) 83111 ex. 121.

The West Wiltshire District Council area is situated in a pleasant rural location with easy access to the towns of BATH, BRISTOL and the M4/M5 motorways with reasonable house prices. Removal and lodging expenses can be provided in appropriate cases.

Application forms are available from Personnel Officer
WEST WILTSHIRE DISTRICT COUNCIL
BRADLEY ROAD, TROWBRIDGE, WILTSHIRE BA14 0RD
or by telephone
Trowbridge (02214-83111 ex. 119)
(Mrs. Tilley)
Closing date 21st September, 1978

PROJECT MANAGER Large ICL 2900 SYSTEMS ANALYST

This Company is currently reviewing its Computer Hardware and expects to upgrade to the above system during 1979. A Project Manager is required to co-ordinate all aspects of the introduction of a Teleprocessing system and the new Machine.

A number of Manufacturing (Batch) Systems exist, and part of the project is to evaluate in what form these are transferred, and to liaise with Software houses to ensure the new system is available in an acceptable timescale.

Both the above positions are senior appointments and would expect to command salaries in excess of £7,000 p.a.

A Company Car will be provided for the Project Manager.

KEY COMPUTER PERSONNEL
01-949 3140

MINI-COMPUTER ENGINEERS

Your opportunity to be at the forefront of mini-computer technology.

COMPUTER ANCILLARIES LIMITED

a subsidiary of a major international company, who market the successful range of MAEL Mini-Computers and Jacquard Systems require experienced personnel at all levels to continue our expansion programme in the South of England.

The successful applicants, male or female, must be able to

- ★ Repair Visual Display Unit based Mini/Micro Computer Systems.
- ★ Work on their own initiative.
- ★ Be aware of the latest technology
- ★ Have a desire to solve problems.
- ★ Repair PCB's to component level.
- ★ Learn systems with the minimum of training
- ★ Willing to work outside normal hours if necessary.
- ★ Wish to advance their careers into Management or Product Specialisation.
- ★ Ability to use software.

The Company provides

- ★ High basic salary dependent upon experience.
- ★ A Company Car.
- ★ Free use of Company Car for private use.
- ★ Relocation assistance if necessary.
- ★ Overtime payments.

Telephone or write to:
Mr. B. McCandlish
Computer Ancillaries Ltd.
64 High Street
Egham, Surrey, TW20 2EY
EGHAM 6455



DATA PROCESSING/ SYSTEMS MANAGER

Our client, a highly successful company operating a rapidly expanding number of retail outlets now seeks a Data Processing/Systems Professional

Reporting to the Financial Director the position is based at the Company's Headquarters in an attractive town north of London, where current facilities are based on an I.C.L. 2903.

The demands of this job will require a subtle blend of technical know-how and management skills. The immediate priorities fall squarely on the operations side where there is a need to implement effective procedures for scheduling and running existing systems, particularly stock-control and payroll routines.

An ambitious corporate plan will provide exciting systems design opportunities and career development prospects which would be difficult to match.

The successful candidate will be in his or her 30s possibly with a degree or equivalent on a related discipline, and preferred experience in an environment where control processing is carried out in remote operating units.

The company regards the remuneration package as negotiable around an indicator of £8,000 per annum.

Please apply in writing, giving all relevant details — all applications will be acknowledged and treated in the strictest confidence, to Box No. C.W.1981.

PROGRAMMERS c £5,200 + mortgage + benefits

Join the computer department of a large American Bank in Central London developing Foreign Exchange and Loans Deposit systems on their PDP 11/65s. When complete these systems will be implemented in their European branches. Ideally candidates will be working for a financial organisation at the moment and have 2-3 years' programming experience using Basic, Cobol or Fortran, preferably on Minis although this is not essential.

You will receive excellent benefits including a subsidised mortgage, BUPA, Life Insurance, non contributory pension scheme, free lunches and profit sharing.

Worth considering? Then contact LINDA BENSTED on 01-636 6775

Computer Personnel International

110 St Martin's Lane, London WC2N 4BH 01-636 6775

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

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+ Allowances

Comprehensive After-Sales Support is a fundamental part of our client's philosophy, and with many installations, and a variety of products, the Product Support Department has developed extensive facilities and highly qualified and experienced personnel.

Continuing their expansion, the Department now require **Computer Engineers** to join their teams in the areas mentioned, maintaining computer or telemetry systems and their associated peripherals.

ABERDEEN: For land based systems in Aberdeen and the Shetlands. Applicants will also be required to work offshore occasionally, and if necessary, on a regular basis. The income package provided will be £6,000 + Offshore Allowances.

EDINBURGH: For land based systems throughout Scotland (except Aberdeen, etc.), with an income package of circa £4,200 + Allowances + Use of Company Car.

Extensive training on equipment will be given by the company and manufacturers, but a minimum HNC qualification must already be held by applicants.

Relocation expenses are available, as are many other company benefits.

To join this major force in Scotland — contact Peter Gorton!

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BELGIUM

ITALY

MIDDLE EAST
(based London)

£10K +
negotiable

If International Support appeals, and you have a detailed knowledge of IBM 370/165 or 370/168 or 360/65, then this company can offer you an exceptional future.

Send your C.V. directly to Peter Gorton by telephone for an application form. Further information will be available.

Suite 201/6 Albany House, 324 Regent Street, London W1R 5AA 01-637 9611

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Large Computer Systems £4-8K package
+ Shift

Experienced and Trainee personnel are required for the site maintenance of installations in Manchester, the Midlands, the West Country and Central London.

Plug-Compatible Peripherals £6-10K package
+ car

Experienced personnel are required for field maintenance of installations in Lancashire & W. Yorks, the Midlands and Greater London.

Small Computer Systems

Experienced and trainee personnel are also required for 'mobile maintenance' positions in the Greater London Area. Details available on request.

Excellent benefits are also provided, extra to the 'packages' mentioned above.

So, if you want variety and a technically demanding environment plus guaranteed career (and salary) progression geared to merit, then apply now! — Contact Peter Gorton.

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Outer & C London to £8K package

Join the company that invented the mini computer and who are now world leaders in its manufacture and marketing.

They are a young, successful and progressive organisation, a rich mix of talents that consistently produce exceptional computer systems that sell widely.

You will be joining a professional computer service team working on mini computers and mainframes, and will receive a thorough training in both hardware and software.

Anyone with 2-3 years' relevant experience, or an HNC/HND in Electrical/Electronic Engineering plus some experience, is eligible for these positions.

Basic salaries will be not less than £5,000 p.a.

Additionally: For Central London they provide allowances of £2,000 p.a. plus Call Out, Standby and/or Shift Payments where appropriate.

For Outer London they provide a £400 London Allowance, a Company Car or Car Allowance, and a good possibility of working from home.

Free Life Assurance is included in the comprehensive benefits package, one you would expect from an expanding international company.

Don't miss this chance to join this successful and progressive team — contact Peter Gorton Now!

01-637 9611

BUYER Printed Circuit Cards/ Flexible Circuits

Greenock, situated in attractive surroundings on the West Coast of Scotland, is the location of IBM's expanding manufacturing plant where we produce some of the most advanced computer products in the world. We're now looking for an experienced man or woman to join our procurement function.

You will be responsible for the handling of high volume sub-contract activities associated with the assembly and test of rigid high density printed circuit cards and the purchase of flexible circuits. This will involve the establishment of highly competitive sources for these commodities, so a knowledge of EEC and Far East market places would be an advantage. As a result, extensive travel both in the UK and overseas will be necessary.

You should be educated to HNC/Degree level in Electrical/Electronic Engineering or equivalent, and have a minimum of 5 years' experience in major contract negotiations, preferably in a high volume electronics industry. Commercial qualifications of a similar level will also be considered.

In return, we offer a competitive starting salary backed by a substantial range of benefits, which we believe to be among the best in industry today. Relocation assistance will be provided where appropriate.

Please write with full details to: Ian Wilson, Personnel Selection, IBM United Kingdom Limited, PO Box 30, Spango Valley, Greenock PA16 0AH or telephone him on Gourock 33700 Ext. 4060 for an application form. Please quote reference CW/936492.



Admiralty Marine Technology Establishment Teddington Computer Operations Manager

The Computer Section of AMTE renders full support to the research programmes and provides an important service to some 20 Defence Establishments and Government Authorities via a terminal system. An ICL 2970 computer operating under the VME/B system will be in use.

The Operations Manager will be responsible for the planning, organisation and control of the installation to ensure efficient and economic operation and provide accurate service to the customer. This will involve close liaison with computer engineers and systems programmers for the continual development of the operating system software. The successful candidate will also take responsibility for operating training, the preparation of shift rosters, computer room security, and the keeping of accounts.

Candidates (aged at least 30) should normally have a degree, or equivalent

qualification, in an appropriate scientific/mathematical subject and must have recent experience of managing a computer system. Candidates without the prescribed qualification, but who can produce evidence of high professional attainment may be considered.

Appointment as Senior Scientific Officer (E5425-E7175) with starting salary according to qualifications and experience. Non-contributory pension scheme.

For further details and an application form (to be returned by 8th October, 1978), write to Civil Service Commission, Alcon Link, Basingstoke, Hants RG21 1JB, telephone Basingstoke (0256) 68581 (answering service operates outside office hours. Please quote ref. S/8906).

SALES EXECUTIVES (MANAGEMENT POTENTIAL)

A very well known British Company is expanding rapidly throughout the UK. They have become even more diversified with the supplying of Mini Computer Systems, Terminals, Distributed Processing Systems, Turnkey Package Systems and Business Systems.

The above have been successfully marketed for the past 18 months. Expansion time is now here.

New branch offices are being opened, so this is a golden opportunity for experienced sales executives in the following areas:

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- * Glasgow
- * Leeds
- * Birmingham
- * London

For your efforts you will earn c. £13,000 + Car, and further your career towards management.

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BRI Taylor 01-839 6087

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NEWCASTLE UPON TYNE
POLYTECHNIC
Department of Mathematics,
Statistics and Computing

LECTURER II IN COMPUTING

Applications are invited for the above post. The person appointed will join a group of staff concerned with the teaching of Computing throughout the Polytechnic.

Applicants should be well qualified in computing and have teaching, research and/or industrial experience. Candidates will be expected to have a special interest in the application of computing to business, commerce and/or finance and be prepared to undertake or supervise research.

Burnham F.E. Lecturer II
04101-68558 p.p.

For further particulars and an application form, returnable by Thursday, 28th September, 1978, please send a stamped addressed footcap envelope to the Staffing Officer, Newcastle upon Tyne Polytechnic, Elton Building, Elton Place, Newcastle upon Tyne NE1 8ST.

UNIVERSITY OF BIRMINGHAM
FACULTY OF COMMERCE
AND SOCIAL SCIENCES
RECRUITMENT

Research Fellow (Range 1A) in Computing

Applications are invited for an S.S.R.C. supported Research Fellowship (Range 1A) in computing in the Department of Economics.

The Research Fellow will be concerned with the development of software including programmes for algebraic manipulation on a CDC 7600. Candidates should, therefore, be well qualified in computer science and have a good knowledge of numerical analysis.

The appointment will be for 16 months from December 1, 1978. Salary on the first five points of the Research Fellow Scale (C3863-C4862 plus superannuation).

Further particulars and application form from the Assistant Registrar (Computing), University of Birmingham, P.O. Box 363, Birmingham B15 2TT, to whom the form, naming three referees, should be returned by Friday, October 6, 1978, quoting reference C/2016/FF.

SOFTWARE MANAGER/ BURROUGHS LARGE SYSTEMS

We require, to lead a Technical Support Team, an experienced Software Programming Manager. The successful applicant will have an in-depth knowledge of Burroughs Large Systems Software: DMS II, COBOL and ALGOL.

The position involves the management of a small team of highly technical staff dealing with the provision and maintenance of software, the recommendation of hardware subject to examination and evaluation. The provision of a training function within the Management Services Department for languages and techniques and the provision and maintenance of standards in computing in conjunction with systems development.

Circa £7,300 p.a. Plus Profit Sharing and many fringe benefits

Write to:

Peter Thomas, Personnel Department
ICI Plant Protection Division
Farnhurst, Haslemere, Surrey



Plant Protection Division

AUSTRALIA CALLING

For details of employment in Australia for experienced E.D.P./Computer Personnel write, enclosing detailed C.V. to

PROFESSIONAL STAFF

388 Bourke Street,
Melbourne, Vic., 3000,
Australia.

COLCHESTER BOROUGH COUNCIL
Borough Treasurer's Department
Re-advertisement

PROGRAMMER/ ANALYST

AP.3/4 £3,420-£4,320 plus non-enhanceable supplement of £312 per annum.

Applications are invited for the above post in the Computer Section. The Council has recently replaced ICL 1900 equipment with ICL 2903, EDS 60s, M.T.U.s and DDEs. A comprehensive range of existing systems will now be redesigned to make full use of the new equipment and some new systems introduced (including terminal facilities where appropriate).

This vacancy has arisen through internal promotion of the present holder. Applicants should have experience of programming in COBOL and disassembled systems. A knowledge of either ICL 2903 PLAN or Local Government would be an added advantage.

The usual Local Government conditions of service apply to this post. Housing accommodation for up to two years and generous relocation expenses are available in appropriate cases. A system of flexible working hours is in operation.

Application forms are obtainable from the Borough Treasurer, Redoubt Chambers, 51 Isaac's Walk, Colchester (Telephone No. 76071 Ext. 219) to whom they should be returned not later than 29th September, 1978. Previous applicants will be considered and need not re-apply.

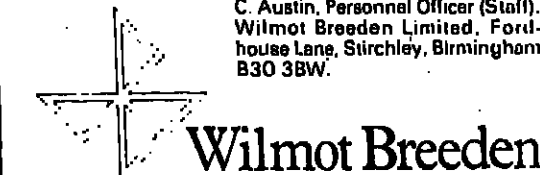
Programmer

Wilnot Breeden Limited, an important supplier of motor vehicle components, is developing its data processing facilities on a new Honeywell 82 unit. The company operates on-line inventory monitoring and batch programmes in COBOL for production and financial control.

We are seeking a mature, well motivated COBOL Programmer aged 25 or over, with four years' varied experience, who wants to develop his/her skills whilst working through a wide range of applications.

We offer a salary negotiable up to £4780, 34 days' holiday in total, subsidised canteen, contributory pension scheme and other benefits.

Applications in writing giving details of training, experience and current salary should be sent to: N. C. Austin, Personnel Officer (Staff), Wilnot Breeden Limited, Fordhouse Lane, Stretchley, Birmingham B30 3BW.



Re-advertisement
UNIVERSITY OF EXETER
FACULTY OF SOCIAL SCIENCES

PROGRAMMER III

The Data Processing Unit in the Faculty of Social Studies requires a programmer III to join a team of four programmers. The Unit has an ICL 472 computer.

The work is mainly of a statistical nature in the creation and analysis of data banks and programmes will be given to applicants with experience of programming in a high-level language and the use of statistical packages. Applicants must have a university degree in a relevant subject but previous computing experience is not necessary as training will be given.

Salary according to qualifications and experience will be within the range £3085-£3604 p.a.

Letters of application stating the names of three referees should be sent to: Dr. J. C. Austin, Personnel Officer, Faculty of Social Studies, University of Exeter, Hatherly House, Hatherly Park, Exeter, EX4 4RJ. Closing date: 21 September 1978. Please quote reference: S/8906.

UNIVERSITY OF NEWCASTLE
UPON TYNE
Computing Laboratory

RESEARCH IN COMPUTER ARCHITECTURE AND OPERATING SYSTEMS

Applications are invited for Research Associate posts on a project concerning the reliability and integrity of distributed computing systems. This Science Research Council sponsored project is a successor to earlier work on the design of highly reliable computing systems, and will involve both theoretical studies and the implementation of prototype systems. Candidates should possess a Ph.D. degree, or equivalent experience in one or more of the following areas: Operating Systems, Compilers, Parallel and Distributed Systems. Appointments will be for up to four years and are renewable. The salary will be at a point on the University's scale £3863-£4862. Applicants should forward a brief resume (typed) together with the names and addresses of three referees to whom the application may be made to Professor S. Handley, Computing Laboratory, The University, Newcastle upon Tyne NE1 7RU. Closing date: 21st October 1978. Please quote reference: S/8906.

PROGRAMMER/ SYSTEMS PROGRAMMER

£4,425-£4,812

For North East Surrey College of Technology. To assist the Computer Manager in providing the College with a Computer service in a wide range of system and application areas. This is an ideal opportunity to gain valuable experience in the use of a modern FORTRAN minicomputer system (Varian V78). BASIC, FORTRAN and TASC are available ON-LINE. In addition we are currently investigating the use of micro-processor systems in the education field. Candidates should be qualified to at least A-level standard and should have several years' experience in computing including use of high and low-level languages and preferably some knowledge of hardware. Opportunities for further training are available. Application form from Chief Administrative Officer, North East Surrey College of Technology, Regent Road, Ewell, Epsom, Surrey, KT17 8DE. Please quote reference: CAQ/88/23.



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PROGRAMMERS-MINI SYSTEMS-SOUTH MIDLANDS
PROGRAMMERS-IBM CICS-MIDLANDS
PROGRAMMERS-FORTRAN-NORTH-WEST
PROGRAMMERS-IBM DOS/OS COBOL-LONDON
PROGRAMMERS-PL/1-LONDON AND SOUTH
PROGRAMMERS-ASSEMBLER-MIDLANDS
ANALYSTS AND PROGRAMMERS-LOCAL AUTHORITY EXPERIENCE-U.K.
PROGRAMMERS-COBOL BURROUGHS-SOUTHAMPTON
PROGRAMMERS-HONEYWELL COBOL-DURHAM
PROGRAMMERS-HONEYWELL COBOL-LONDON

NORTH WEST - ANALYSTS

Packages to £7,500 + O/T pay

The E.M.S. consulting group has a large quantity of vacancies for additional Analysts to handle expanding systems requirements in the North West region. Candidates should have a minimum of 2 years' systems experience and preferably although not essentially, past programming experience. Our major current requirements are for both Analysts and Senior Analysts to work on commercial systems development. Projects will include Ledger Systems, Stock Control, Warehousing and Distribution, Chain Store Systems, Database and Network Systems. Ability to work in conjunction with client team members and maintain a high professional standard will be important. Relocation assistance will be paid where appropriate. Telephone our Birmingham Data Centre urgently for early interviews on 021-454 7806 (Don Philip). Please complete the attached application form in addition and return to Newcastle, Staffs today. Over 20 current vacancies are available at very attractive salary levels.

TOP SALESMEN

E.M.S. is planning substantial further development of both our Consultancy and Turnkey Systems Divisions during the coming months. Our Consultancy activities extend across all mainframe ranges and encompass a wide range of industrial/commercial organisations. Applications must, therefore, present as high level Business Analysts capable of rapidly assessing clients' requirements and proposing relevant solutions where appropriate or quantifying the relevant consulting experience required in either systems or programming and providing the necessary staff from E.M.S. resources. A vast potential market exists for salesmen marketing resource support.

Equally, our Turnkey Systems Division provided total U.K. coverage.

ANALYSTS & PROGRAMMERS

BIRMINGHAM

To £6,000

We currently have a large volume of vacancies throughout the Birmingham and West Midlands regions, including a wide variety of new jobs at the rapidly expanding E.M.S. Data Centre. COBOL and ASSEMBLER programmers should complete our application forms today as an urgent priority. We have an unparalleled range of vacancies available in addition to hundreds of client vacancies. E.M.S. also have interesting and challenging vacancies within our Turnkey Systems Division for candidates seeking the opportunities of constantly working on new development projects within a modern, attractively furnished Data Centre. Interviews are held daily at the Data Centre - Why not come along to discuss your career development projects within the Midlands? E.M.S. as the largest recruitment consultancy in the country, has opportunities available for all D.P. staff which are unrivalled throughout the Midlands. Equally, please do not hesitate to complete and return today the attached application form. For only a few minutes initial correspondence the lucrative career opportunities will be forthcoming for you make your time worth the investment. Consultant: Don Philip/Damian Handlip.

10K-20K (and it is earnable!)

marketing Honeywell Level 6, mini-computer, systems and supporting software to a wide range of U.K. users. Experienced Salesmen capable of developing their own territories are urgently required. A substantial quantity of leads are also supplied by extensive and vigorous advertising campaigns and Road Show ventures. Salesmen must possess an adequate mini-computer knowledge for Turnkey Systems positions. Cars will be provided with adequate base salaries and high prospective incentives. Apply by telephone for interview during the next week at our Birmingham Data Centre. All U.K. territories will be controlled from the pending regional development of other Centres. Consultant: John Wood.

E.M.S. is where the careers are!

We have many contract vacancies advised each week. Telephone now for a Contractor's profile form urgently and we will offer you an unrivalled selection of opportunities each month. Even if you are not available for a month or two, register today and let us reserve top opportunities for you to be phased on to later. Telephone 0782-623665 (10 lines). Don Philip, Don Walklate, John Wood, Selina Mills.

E.M.S. is where the careers are!

WHY NOT SEE HOW MUCH £££ THE TOTAL MARKET VALUES YOU?

EMS are inundated every week with hundreds of new vacancies. Equally we provide employers throughout the entire UK with a total weekly list of candidates seeking new opportunities within their area. Each candidate can be cross matched against as many as 3,000 vacancies to find ideal computerised matchings. Many candidates have as many as 50 prospective interviews to choose from with EMS. We find every possible opportunity for you. Hundreds of pounds of personalised efforts and free. EMS get results. Let the EMS computers go to work for you! Support your industry! Complete the EMS career form.

TURNKEY SYSTEMS—SYSTEMS DEVELOPMENT MANAGER

NEG + BONUS

EMS has embarked upon a further development with the launching of a sophisticated new Data Centre based in Birmingham and handling U.K. Turnkey Systems Development. We now require a Senior, experienced Manager capable of guiding and directing Analysts in Feasibility Studies with prospective clients to the stage of requirements and drafting of final tenders. Equally, a competent knowledge of systems programming and operating systems is sought. We envisage the successful applicant having previous experience of manpower planning and control. Ability to motivate and lead will be an important factor. Equally, we anticipate candidates having a good technical knowledge of Data Processing, with sound commercial knowledge and judgement. Ability to present a corporate business case to clients at Board level will be important as will the willingness to address a user group of between 50 and 200 delegates at annual conventions.

The successful Manager will play a major role in the development of our Turnkey Systems Division and must be prepared to accept the pressures and responsibilities commensurate with a high growth sector, in order to progress to the ultimate career opportunities within the company. A bonus scheme is in operation for senior management throughout the group and assessed on individual unit performance. The position represents the opportunity of joining a new division with early impact upon management. Experience within a consultancy or turnkey company would be advantageous. Age 30 to 50 preferred. Relocation assistance where appropriate. Apply initially to J. Wood, Managing Director, and return the attached form to the Newcastle office.

D.P. MANAGER DESIGNATE

THAMES VALLEY

UP TO £7,000

Our client, who has recently ordered an IBM System 3 Model 15 and a remote System 34, is looking for a highly professional Analyst/Programmer with the potential and drive to become the company's Data Processing Manager in approximately 2 years time.

The successful applicant for this challenging and rewarding position will have a proven record of successful project implementation and 2 years experience of programming in RPG II. He or she will initially play the major role in implementing an extremely sophisticated order processing and inventory control system, with equally challenging and interesting new developments planned for the future.

The position reports directly to the European Data Processing Manager and is based on rural surroundings in the heart of the Thames Valley, but there will be a future requirement for some European travel.

Our client is offering an exceptionally attractive benefits package in addition to a starting salary of up to £7,000 per annum to the successful applicant who has his or her long-term career in mind.

If you are interested in this first-class opportunity, please complete and return the attached application form bearing EMP/TV to Mr. DON PHILIP, 021-454 7908.

COBOL PROGRAMMER

BIRMINGHAM

TO £5,200

An engineering group with a Honeywell Level 82 services computer urgently need an experienced Cobol Programmer. Any machine accepted to help with ongoing development and maintenance of existing systems. Candidates must be capable of working for long periods without supervision and be accustomed to providing a high standard of support documentation. Occasional involvement in systems development will also be available at required. Current applications include sales order processing, analysis, purchasing and stock control. A small team handles all development and maintenance with external consultancy assistance for any major development work.

CONSULTANT DON PHILIP TEL 021 454 7908

PROGRAMMERS

HERTS

TO £6,400

Boston's first IBM System 30 site has a large number of outstanding vacancies on numerous interesting new development projects. Experienced IBM PROGRAMMERS are urgently sought to work on large project teams. Any IBM TPO experience would be especially valuable. Otherwise, general OS/COBOL will be acceptable. Relocation assistance provided.

CONSULTANT DON PHILIP TEL 021 454 7908

ANALYST PROGRAMMERS AND PROGRAMMERS

ESSEX

TO £5,000

Experienced programmers are urgently required for a group bureau to work on a wide variety of client systems and packages. Candidates should possess a minimum 2 years' experience and be familiar with COBOL or PL/I in a commercial environment. Further experience will be an advantage. With an interesting and challenging project, and good career development opportunities, this is an excellent opportunity for a motivated individual. Relocation assistance will be provided where appropriate.

CONSULTANT DON PHILIP TEL 021 454 7908

ANALYSTS

HERTS

TO £7,200

One of Britain's largest trading groups has a large number of outstanding systems vacancies in its computer department. The client requires an IBM Systems Analyst/Programmer with a proven record of successful project implementation and 2 years experience of programming in RPG II. He or she will initially play the major role in implementing an extremely sophisticated order processing and inventory control system, with equally challenging and interesting new developments planned for the future.

The position reports directly to the European Data Processing Manager and is based on rural surroundings in the heart of the Thames Valley, but there will be a future requirement for some European travel.

Our client is offering an exceptionally attractive benefits package in addition to a starting salary of up to £7,200 per annum to the successful applicant who has his or her long-term career in mind.

If you are interested in this first-class opportunity, please complete and return the attached application form bearing EMP/TV to Mr. DON PHILIP, 021-454 7908.

OPERATORS

NORWICH

TO £3,200

Applicants are required for the operation of 2 IBM 360s working on a three shift system in a bureau environment. The operator is responsible for running either one of the above machines. Equally, there is close liaison with Data Control. The successful candidate must be trustworthy in appearance and be capable of effectively representing the company in occasional client discussions.

CONSULTANT SUSAN ADAMS

ANALYSTS

BRIGHTON

TO £5,000

Analysts are sought within the Management Services Department of a large industrial group which is responsible for all computerised and non-computerised systems and procedures. Applications areas include Finance, Marketing, Manufacturing and Payroll. The company has IBM hardware, but will accept alternative machine experience. A minimum 'A' level educational standard is preferred. Relocation assistance provided.

CONSULTANT CAROL PROUDMAN

TURNKEY SALESMEN

U.K.

TO £8,000

A large mini producer requires numerous additional salesmen to assist with expansion plans throughout the U.K. and to promote a wide range of equipment to industrial and commercial users. Office locations include Birmingham, Manchester, Brighton and Leicester. All candidates must possess a minimum 1 year's experience marketing small business systems.

CONSULTANT DON PHILIP TEL 021 454 7908

ANALYSTS & PROGRAMMERS

NOTTS

NEG

A major pharmaceutical group is seeking staff to work on a major stock replacement system. The client requires an IBM Systems Analyst/Programmer with a proven record of successful project implementation and 2 years experience of programming in RPG II. He or she will initially play the major role in implementing an extremely sophisticated order processing and inventory control system, with equally challenging and interesting new developments planned for the future.

The position reports directly to the European Data Processing Manager and is based on rural surroundings in the heart of the Thames Valley, but there will be a future requirement for some European travel.

Our client is offering an exceptionally attractive benefits package in addition to a starting salary of up to £8,000 per annum to the successful applicant who has his or her long-term career in mind.

If you are interested in this first-class opportunity, please complete and return the attached application form bearing EMP/TV to Mr. DON PHILIP, 021-454 7908.

SYSTEMS ANALYST

SURREY

TO £7,000

Responsibilities will include making a technical input to many projects where a high software content is involved and in particular to enable the company to engage in projects where micro processors are a large part of the job content. The candidate elected will be highly versatile and yet able to utilise special micro processor knowledge whenever required. We envisage candidates having a good knowledge of simulation software, a capability to train others in micro processor technology and have the ability to sell micro processor systems to new potential users.

CONSULTANT DON PHILIP TEL 021 454 7908

SYSTEMS ENGINEERS

SOUTHERN REGION

TO £7,500

A large number of opportunities currently exist with Southern manufacturers for experienced technical programming and systems staff to work in the Aerospace Defence Systems and Process Control systems. Basic requirements are for a sound knowledge of analogue and/or digital computing, real time programming using ASSEMBLER, FORTRAN or COBOL and a possible knowledge of simulation techniques. Particularly advantageous would be any knowledge of aircraft flight simulation and derivatives, or engine design and development or mathematical modelling. Complete the EMS career form today and let us provide a whole new world of current opportunities for you within an area of your choice.

CONSULTANT DON PHILIP TEL 021 454 7908

SYSTEMS ANALYST

MIDDLESEX

TO £6,600

The successful applicant will have at least 3 years' experience in systems programming, preferably using COBOL. Equally, he/she will have designed or controlled the development of major computer systems through to implementation. On-line systems experience, especially again with intensive programming knowledge is sought, preferably using CICS. All applicants must have good IBM 370 experience.

CONSULTANT JOHN WOOD

COMPUTER MANAGER

S.W. LONDON

TO £7,750

Preference will be for graduates in degree level candidates capable of controlling IT operations and in analysis and programming. The successful candidate will report to the Data Processing Manager and be responsible for the day to day running of the department. The position involves responsibility for the specification and design of computer systems, ability to control and delegate tasks to analysts and programmers, ability to define and maintain work schedules within operations and to set and maintain standards. Previous experience of NCR would be advantageous although other hardware will be acceptable.

CONSULTANT DON PHILIP TEL 021 454 7908

CUSTOMER SERVICES PROGRAMMERS

BERKSHIRE

TO £6,000

Our client is a major bureau providing a diverse range of services to Southern accounts. Preference will be for candidates with ICL 1900 or 2900 years experience using GEORGE III or VME, COBOL, FORTRAN or PLAN languages. Successful candidates will be responsible for customer training and will produce and run client demonstration. Equally, he/she will visit prospective clients with salesmen and also make courtesy visits to established clients. We envisage you working customised software and production of technical literature.

CONSULTANT DON PHILIP TEL 021 454 7908

200 SYSTEMS DESIGNERS AND PROGRAMMERS

MANCHESTER AREA

TO £7,500

Systems Designers and Senior Designers have responsibility for the design and production of complete suites of software and for the migration of software and hardware in major custom-designed projects. They are also expected to provide technical support to sales staff and users. Programmers and Senior Programmers are sought for customer training and will produce and run client demonstration. Equally, he/she will visit prospective clients with salesmen and also make courtesy visits to established clients. We envisage you working customised software and production of technical literature.

CONSULTANT JOHN WOOD

ANALYSTS PROGRAMMERS & PROGRAMMERS

LONDON SE1

TO £7,000

The successful applicant will undertake overall responsibility for 2-3 large systems, user communications, analysis of requirements and modifications of new work. Equally, assistance will be expected with programming and amendments to existing systems and will judge each program on its/her potential contribution towards the installation. Career progression opportunities are good. Please complete the attached application form and return to ASAP. Job spec will be forwarded by return.

CONSULTANT CAROL PROUDMAN

PROGRAMMERS TO SYSTEMS ANALYSTS

LEEDS

UP TO £7,000

A substantial quantity of new positions are now available with 2 years' experience in systems programming and will judge each applicant on his/her potential contribution towards the installation. Career progression opportunities are good. Please complete the attached application form and return to ASAP. Job spec will be forwarded by return.

CONSULTANT DON PHILIP TEL 021 454 7908

ANALYST/PROGRAMMERS

ESSEX

TO £6,000

Our client requires practical knowledge of programming with at least 2 years' COBOL experience. Equally, they seek practical experience in the design and implementation of at least 2 major projects, preferably associated with Accounting or Production/Stock Control. Experience of ICL or Data General equipment would be advantageous. Applicants must be well motivated and capable of working in a bureau environment.

CONSULTANT CAROL PROUDMAN

SYSTEMS & PROGRAMMING CONSULTANTS

£6,000-£8,000

For those lucrative positions with the consulting support division of a major manufacturer working in the Local Government and Defence Sectors, we seek experienced candidates with at least 7 years' experience in programming 'Hardware knowledge' using ICL 1900, 2900s, 1600s, 2800s or 2900s will be essential. Within the Software Sector we envisage you having sound knowledge of Datacom Systems using ICL 1900, 2900s, 1600s, 2800s or 2900s. Some previous knowledge of Real Time could be advantageous and especially so would be any experience with DRIVER Control, Manager etc. Candidates must be able to assist with client support throughout varying U.K. regions. Attractive career development opportunities exist for successful candidates.

CONSULTANT DON PHILIP TEL 021 454 7908

PROGRAMMER/ANALYST

SURREY

TO £6,000

Education to HNC/Degree level is sought. Duties will include one or more of the following:

- (1) Programming in a high level Test Applications language (ATLAS) analysis/validation of Atlas programmes.
- (2) Programming in AS/300 Symbolic Assembler (ATE Controller/Computer type 900).
- (3) Programming in DGS PDP-11 ASSEMBLER, use of PDP-11 for GDBAL 66 programming. We seek some knowledge of micro computer systems and automatic test techniques. Candidates ideally will currently be employed either by a software manufacturer or a major electronics supplier.

CONSULTANT DON PHILIP TEL 021 454 7908



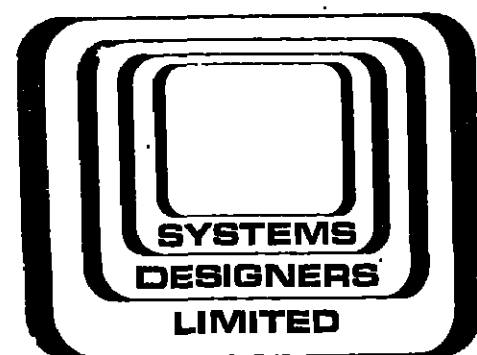
EMS CONSULTANTS LTD
61 LOWER STREET
NEWCASTLE UNDER LYME
STAFFORDSHIRE, ST5 2RS
Telex 36636

Management Services to Computing Division
Telephone : 0782 62365/6/7/8
Employment Agency & Employment
Business Centre No. M65
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SURNAME Other Names		Telephone	
Address		Home	
Post Code		Bus	
Age	Date of Birth	Place of Birth	Nationality
Married	Children	Car Owner	Driver
Position Required		Required Salary Range	
Present Position		Salary	
WHERE DO YOU WISH TO WORK			
Within U.K.	Yes/No	Acceptable Areas	Abroad
Will you move	Yes/No		Europe
			Middle East
NUMBER OF YEARS EXPERIENCE			
Operating	Programming	Systems Design	Systems Analysis
			Management
Total			
Available for Interviews			
Available for Employment			
DETAILS OF SECONDARY AND FURTHER EDUCATION			
Schools	Date	Examinations Passed	
College/University	Date	Examinations Passed	
Business Courses with Dates			
1 Present Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
2. Previous Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	

COMPUTER WEEKLY, September 14, 1978			
For Office Use only			
Company Ref. No.			
Reason for Seeking Change			
Details of type of position wanted			
Additional Information			
Please explain below, in an 8-10 line precis, your current duties and applications experience			
FOREIGN LANGUAGES			
Spoken	Written	Read	
Please show the number of years experience of the following. Where your experience is not specified please use the blank spaces.			
HARDWARE	OPERATING SYSTEM	LANGUAGES	PACKAGES/SOFTWARE
IBM 360/370	DOS	COBOL	FILETAB
ICL 1900	OS	FORTRAN	DRIVER
ICL 2980/2970	MVT/MFT	ASSEMBLER	CICS
ICL 2903	GEORGE 1	PLAN	IMS
UNIVAC 1100	GEORGE 2	PL1	BOMP
BURROUGHS 5700/6000	MCP	RPG2	D BOMP
BURROUGHS 5700/6000	Exec 8	USERCODE	PERT
HONEYWELL 66	GCOS	AUTOCODE	V SAM
HONEYWELL 6000	OS 2000/200	EASYSOCODER	IDS/TDS
HONEYWELL other	VMES/VMER	NEAT	MICROFILMING
NCR	J Level	CORAL	TELEPROCESSING
ICL System 4		DL1	DMS
PDP			
3. Third Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
PLEASE CHECK THAT EACH SECTION HAS BEEN TICKED APPROPRIATELY			
ADDITIONAL INFORMATION			
General			
Data Processing			
Terminals			
Software/Packages			
Application Areas			
Projects and Responsibilities			

20410 1250



PROGRAMMERS FOR MINI AND MICRO REAL TIME APPLICATIONS

Systems Designers Limited is a leading well-established and expanding Software Systems Consultancy specialising in mini-computer and microprocessor real-time applications, and operating at the forefront of technology. Growth areas of the Systems Division include:

- Communications —** Emulators, Message switching, Telex systems, Communications Management Systems, Computer Communications
- Industrial —** Process control and Monitoring, Plant Control, Simulation, High Speed data analysis
- Military —** Modelling, Avionic Systems, Complex rigs, Simulators, Microprocessor missile systems.

Systems Designers Limited controls the career progression of its staff to give them a wide variety of experience, both of project applications and of computer systems. The company is situated on the Surrey/Hampshire border, with good road and rail links to London and yet surrounded by attractive countryside.

Systems Designers Limited require:

Graduates Up to £3,600
Your education has given you a good academic training. Systems Designers Limited will use this to provide you with a wide practical computing experience. If you have a degree or expect to qualify shortly in a numerate discipline then contact us to discuss your opportunities.

Programmers Up to £4,500
Programmers are required with up to 2 years experience. As a leading company in mini-computer and microprocessor systems, Systems Designers Limited can provide you with a wide variety of experience in the technical computing fields.

Software Engineers Up to £6,500
Systems Designers Limited require software systems engineers with up to 5 years' experience in Communications, Industrial or Military systems. We can provide you with a rewarding career at the forefront of technology.
If you can match the challenge of a varied and demanding career, then telephone or write to us to arrange a chat or request an application form.

Contact: Bill Hockey

Operations Director
Systems Designers Limited
Systems House
57-61 High Street
Frimley, Surrey GU16 5JJ
Camberley (0276) 83471

Telephone:

GO COMPUTER SERVICES...
CWS Computer Group

Senior Systems Analysts Systems Analysts Senior Programmers Programmers Manchester Based

CWS Computer Services satisfies the total data processing needs of the £1,400 million turnover Co-operative Wholesale Society Limited and in addition provides computer services to Co-operative Retail Societies and other commercial organisations through its six regional Computer Service Centres.

A planned expansion of the Computer Group Software Department has led to vacancies for Analysts and Programmers to work on a variety of development projects for Manufacturing, Warehousing and Distribution and Accounting systems. Many of these development projects include the use of terminals linked to one of the Group's main-frame computers.

Competitive salaries will be offered to the right applicants with relocation expenses where appropriate. If you would like to discuss these opportunities telephone: Peter Griffiths, Systems Manager ext. 6826, Tom Wilson, Programming Manager ext. 6848 or write giving full career details to Bobbie Buchanan, Computer Group Personnel Officer, CWS Limited, P.O. Box 53, New Century House, Manchester M60 4ES. Tel. 081-834 1212.



CWS MAINFRAMES

Manchester 2 x ICL 1904S (shortly to be enhanced to 3 x ICL 2960)
Glasgow ICL 2904
Ipswich ICL 2904
Nuneaton ICL 2904
Birtley ICL 1902T
Godalming ICL 1904A
Liverpool ICL 8959

University of Glasgow

COMPUTING SERVICE

Cobol Programmers

Applications are invited from individuals with experience of programing in COBOL for two posts within the Administrative Data Processing Group of the Computing Service. Duties will relate to the transfer to the University's new ICL 2976 computer of existing tapes of programs and to the development of new programs in the above areas of the facilities of the new machine.

Appointments will be made at the grade of Programming Assistant, or Senior Programming Assistant I, with initial placement dependent on age, qualifications and experience. The salary scales for these grades will be currently under review, range from £2370 to £3114 and from £2956 to £3816, respectively, per annum.

Applications, which should include the names and addresses of two persons, to whom reference may be made, should be addressed to Dr G. H. S. Brown, Director of Computing Services, The University of Glasgow, Glasgow G12 8QQ, from whom further particulars can be obtained. Applications should arrive not later than 22nd September, 1978, and all correspondence should quote Reference Number 4242P.

Re-advertisement

SUNDERLAND POLYTECHNIC
FACULTY OF SCIENCE
Department of Mathematics and Computer Studies

SENIOR LECTURER IN COMPUTER STUDIES (SYSTEMS ANALYSIS AND DESIGN)

Applicants should be graduates, or possess equivalent professional qualifications, and should have recent practical experience outside the field of education.

The successful applicant will have a senior role in a small team, responsible for courses up to honours degree level in Data Processing.

Salary scale: Senior Lecturer Grade £8,051 - £7,068 per annum. An application form and further particulars may be obtained from the Personnel Officer, Sunderland Polytechnic, Chester Road, Sunderland, SR1 3SD, and should be returned as soon as possible.

SYSTEMS ANALYST

DUBLIN - £6-7000

THE COMPANY one of Ireland's long-established and most progressive manufacturing industries based on the outskirts of South Dublin.

THE D.P. DEPT. is a small and friendly unit having recently upgraded its hardware to an ICL 2904 utilising JCL and plans to install T.P. in the early part of next year.

THE APPOINTMENT requires an Analyst who is competent in all aspects of analysis as well as being able to supervise a small team and deputise for the Data Processing Manager in his absence.

This is an excellent opportunity to join the team at an extremely interesting stage of development, allowing the selected candidate to broaden and contribute to her skills within a rapidly changing environment.

For further details please quote C.W.206

EDMUND HOWARD & PARTNERS

5 BRIGHTON ROAD, SURBITON, SURREY
TEL: 01-399 9188
38 GRAFTON STREET, DUBLIN, IRELAND
TEL: 77-57-56

Major new commercial scientific and engineering applications

Systems Analysts
Up to £6000 p.a. (Ref. F375)

Programmers
Up to £5550 p.a. (Ref. F358)

The authority operates an ICL 2976 computer and a network of ICL 2903s in divisional centres to meet its increasing computing requirements. Many systems have been implemented but there are still major areas for development in the commercial, scientific and engineering application areas. Communications techniques will be used as appropriate in this new phase of development.

There is currently a need to strengthen certain project teams at the systems analyst and experienced programmer level and applications are invited for those posts from suitably experienced and qualified personnel (male or female). All posts are based at Sheldon on eastern outskirts of Birmingham.

Further details and application forms are available from the Regional Personnel Manager, Severn-Trent Water Authority, Ableson House, 2297 Coventry Road, Sheldon, Birmingham B26 3PU. Telephone: 021-743 4222, ext. 76 or 77.

GUILDFORD BOROUGH COUNCIL RPG 2 Programmer (£3,852 - £4,266 p.a.)

Applications are invited for the above post in the Council's Computer Section, which operates an ICL 2903 computer with 28K store, EDS 80's and DDE. Delivery of a 7502 is expected shortly.

Experience of RPG 2, preferably on an ICL computer, is essential, and experience of ICL software would be an advantage.

For further details and an application form please contact the Personnel Officer, Guildford Borough Council, Millmead House, Millmead, Guildford, Surrey. Telephone Guildford 71111, Ext. 98.

Closing date 26 September, 1978.

Northern Regional Health Authority

Senior

Computer Programmer

The Northern Regional Health Authority require a Senior Computer Programmer with a minimum of 5 years' COBOL experience, some of which should have been in a supervisory capacity. A knowledge of PLAN would also be an advantage.

The computer services for the region are centralised at the Authority's Headquarters at Walkergate, Newcastle-upon-Tyne.

The work carried out includes hospital, nursing, financial, administrative, works and community health systems together with experimental projects involving the use of terminals.

The modern computing centre contains a 96K 1904S running under George 3. Techniques used include on-line program development via VDUs.

A 37-hour flexible working week is in operation.

Salary scale (Scale 9) £4959-£6025.

New entrants to the service will normally start at the minimum of the scale. Application forms and job descriptions available from Regional Personnel Officer, Northern Regional Health Authority, Bonfield Road, Walkergate, Newcastle-upon-Tyne, NE8 4PY. Closing date 26 September, 1978.

TIMES NEWSPAPERS LIMITED SENIOR PROGRAMMER £7,000

Times Newspapers Limited are currently implementing one of the most advanced computer based newspaper production systems in the U.K., utilising data base and real time techniques on a network of mini-computers. A Senior Programmer is required who will be responsible to the group Data Processing Executive for all aspects of software development.

Applicants must have at least five years' mini-computer programming experience, preferably using Hewlett-Packard equipment, and be capable of communicating with all levels of staff and of planning and controlling software development projects. Additionally this position requires several of the following attributes:

- A working knowledge of FORTRAN IV and Assembler languages.
- Experience of real time and database processing techniques.
- The ability to write interface software for non-standard peripherals.
- Experience gained in either the newspaper or publishing fields.

Salary negotiable depending on qualifications and experience.

Please write with full personal and career details to: **Deborah Hayes, Employment Manager** TIMES NEWSPAPERS LIMITED, 200 Gray's Inn Road, London, WC1

CHIEF PROGRAMMER

Leicester c£6500

Our client a leading British group wishes to strengthen its programming department. This vacancy in an ICL 2900 installation arises through internal promotion and further expansion of services to the group.

A mature professional programmer is required to take charge of all aspects of applications programming. Candidates should have at least five years commercial programming experience using COBOL and previous experience of ICL equipment would be advantageous.

The successful candidate will probably be a team leader in a large installation or already a Chief Programmer in a smaller department.

A generous salary package will be negotiated around £6500 and removal expenses paid in appropriate circumstances.

Please telephone or write to Ivor Norton, in complete confidence, quoting reference c/78082 at the address below.

Ivor Norton Management Services Ltd

Recruitment Consulting Division

P.O. Box 63, Copthall Tower House, Harington HGL1TS Tel. Harington 66628

THORBAR

RECRUITMENT AND CONSULTANCY SERVICES

Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

PARIS SYSTEMS ENGINEERS— OS/MVS/VM Circa £12,000 per annum — plus relocation expenses

We are seeking to identify well-qualified candidates to fill the above positions.

You will ideally possess up to three years' sound experience from working within an OS/MVS/VM environment involving Systems Generation and the design and writing of Software Utilities.

It is expected that you will be well qualified academically — preferably with a degree.

You will be called upon to act in a consultancy role, guiding and advising clients in the use of this software and it will therefore be desirable, although not essential, for you to be fluent in the French language.

WEST GERMANY PROJECT LEADERS/ANALYST PROGRAMMERS Salary range £12,000-£16,000 p.a. — plus relocation expenses

OUTSTANDING OPPORTUNITIES FOR YOU TO WORK ON THE DEVELOPMENT OF NEW MINI SOFTWARE AND PRODUCTION CONTROL SYSTEMS

PROJECT LEADERS:

We are looking for candidates who possess a sound Systems background gained from designing and implementing Production Control Applications.

Preference will be given to applicants who have worked in these areas designing systems for mini-computer hardware such as PDP11, Siemens 330 or Philips P800. The ability to speak German is highly desirable.

ANALYST PROGRAMMERS:

Experience in writing and developing operations software for mini-computer hardware essential.

Assembler programming experience or equivalent type low level language important.

Any experience of Communications Software will prove valuable.

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